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# DOS WORLD

The PC Productivity Magazine

January 1995

Number 19

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**14**  
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With DOS's InterLink

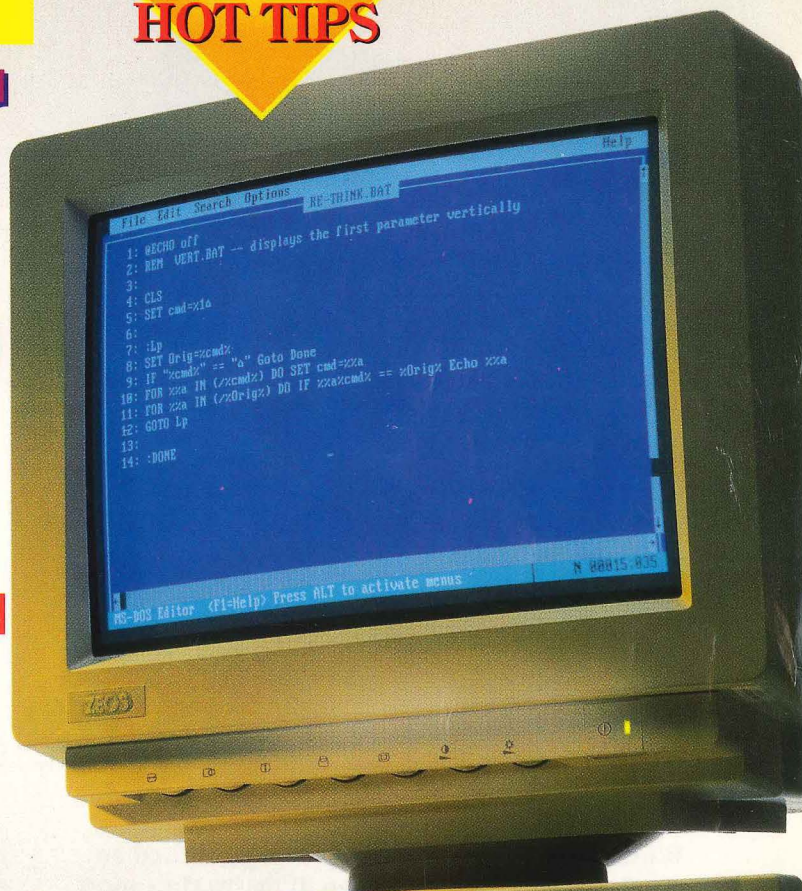
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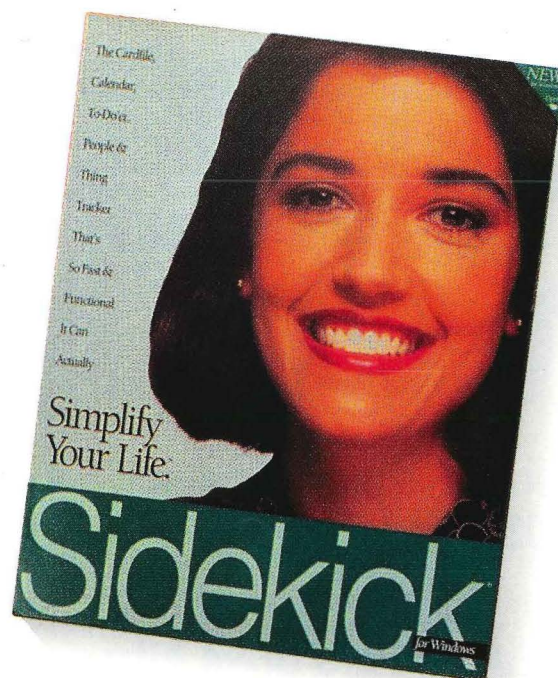
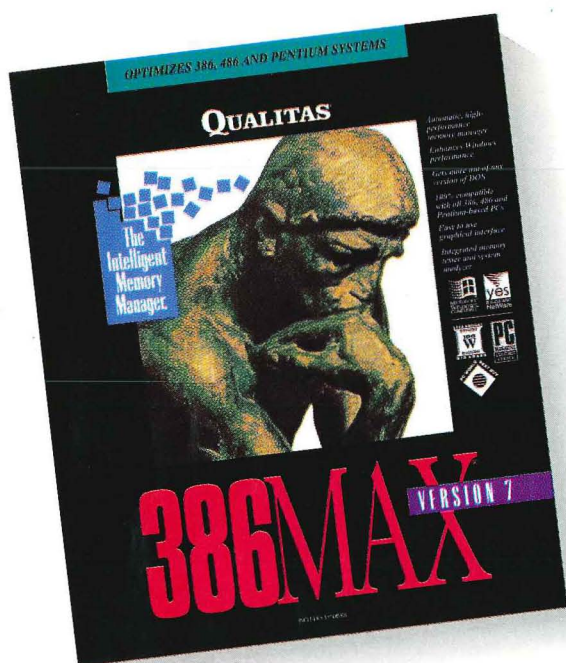
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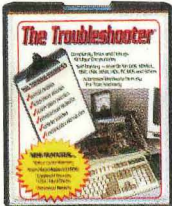
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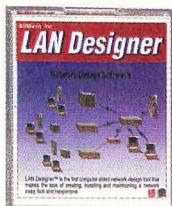
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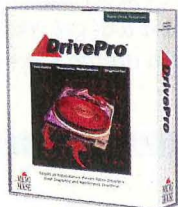
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# DOS WORLD

Number 19, January 1995

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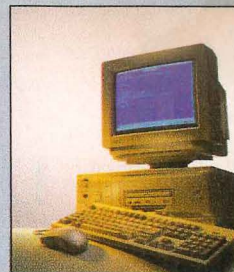
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COVER PHOTO BY LARRY DUNN

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DOS World welcomes letters, complaints, and submissions from readers. The easiest way to reach the editors is the U.S. mail: DOS World, 80 Elm St., P.O. Box 802, Peterborough, NH 03458-0802. All letters to the editor and questions are understood to be submitted for publication unless otherwise indicated. You can reach our staff electronically over CompuServe at 75300,2361. Please include your complete address and a daytime phone number on your correspondence.

Also, you can reach the editors through the DW bulletin-board system (603-924-3181). To connect, set your modem and software to 8 data bits, no parity, 1 stop bit. DW's BBS lists all the QBasic and shareware programs mentioned in these pages. Shareware items listed on the DW BBS are products protected by copyright law. You're welcome to try these programs. If you find them useful, we ask you to register and pay the applicable fees to the programs' respective owners.

DW encourages the submission of DOS tips, QBasic programs, and batch-file articles from readers. Please submit all material on disk in ASCII format together with a double-spaced printed copy to our offices. The magazine cannot be responsible for the return of these manuscripts, unless an appropriate mailer and return postage are enclosed.

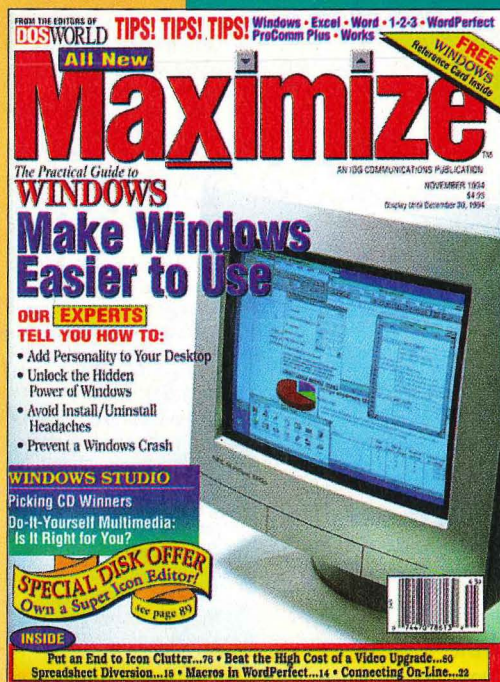
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## EDITORIAL

# Software Publishing Makes Strange Bedfellows

by Michael J. Comendul

Can something good come of Novell's decision to cease upgrading Novell DOS 7? Not for the DOS computer user—not that I can see. What's the story? Steve Tucker told me the company has gone about as far as it can with DOS. He's the head of a gang of programmers, headquartered in England, who've been working on DOS improvements since Novell purchased Digital Research. The signal improvements that ironically put an end to DOS development were Novell DOS 7 breakthroughs in multitasking and built-in networking. That's Novell's story.

Funny, though, the lid Novell placed on DOS in August was followed immediately by new discussions between Novell and Microsoft concerning Windows development and Novell's Netware product. The talks came a month after the Dept. of Justice failed to take strong action against Microsoft for its MS-DOS licensing practices. Reportedly, Novell was one of the chief complainers; it makes you wonder whether Novell DOS 7 isn't some sacrificial lamb to the spirit of renewed cooperation. Though Novell had no intention of killing its product, its decision to stop upgrading it is as good as pulling the plug. It's a fact of software economics that if a company shows no interest in pushing its product, neither will the retail community.

Since I've spent some time in this space praising the company for its attempt at marketing a competitive DOS, I should tell you where owners of the operating system can go for help in the future. The same place you always did, according to Novell: Novell says it will continue to sell DOS 7 and to support it. Novell DOS 7 owners can call the technical-support line, (800) NET-WARE, and reach its forums on line through CompuServe. The forums are manned largely by volunteers, however. Not that they aren't a dedicated, knowledgeable, and friendly bunch, but the practice of using volunteers to answer customer questions seems somewhat equivocal in a company committed to supporting its product.

In addition, one peek at the Novell forums on a service like CompuServe is daunting. From the message threads in the Netwire in the Desktop Products Forum, I made my way to the libraries and followed instructions to download files of interest to Novell DOS 7 users, but I had no luck. Filenames I'd dutifully copied down from the message threads reportedly didn't exist when I arrived at the libraries. In fairness, Novell has tried to improve the tangle of its forums by introducing a Technical Information Database (GO TID on CompuServe) containing all the updates to Novell DOS 7 and compatibility bug fixes. You'll find the TID a bit simpler to use, and I found it easier to understand. The update to Novell DOS 7 is clearly labeled, and so are problem fixes, such as the trick of disarming the Logitech mouse, version 6.3, to run WordPerfect 6.0 for Windows. The file area will remain updated, according to Tucker.

So what did happen to Novell DOS 7? The truth is probably easier to understand than I'm making out. Perhaps it's the same truth that has kept Novell DOS 7 tips and techniques out of these pages: The Novell DOS 7 marketplace never quite materialized, and, given the current software landscape, probably never could have. ■



# Letters to the Editor

## Hold On a Minute

I'm still on hold. (I've waited more than a half hour today.) I'm tired of software companies showing a willingness to take my money, but failing to offer any help beyond that. A month ago, I ordered an "intro" package, and I have yet to receive it.

Feeling that there was a problem with the order, I called the company back three times. Each time they hung up on me or transferred me around in an endless circle. Today is the fourth time in a week I've contacted the company regarding my order.

Do I just give up and forget about the money I mailed? The least I can do is write to you and hope that someday I'll be treated as a customer. My point is this: If a company can't put service behind the products it sells, then no matter how good the product is, in my eyes it's a loser. Any company can take someone's money, but giving people service is a different story.

Wait—my phone call has just been answered. They lost the order.

*Ed Benson  
La Cañada, Calif.*

## Watch Where You're Going

I'm very pleased with your magazine. After I discovered it among all the other so-called computer magazines, I realized that yours is the only one in which I can always find a bit of information that will help me with computing.

As time progresses, however, I notice that *DOS World* is becoming more and more filled with advertisements. Also, most of the articles are now on topics relevant to only DOS 5 and 6.x. Your magazine was

great the way it was before; it had many articles on a wide variety of subjects. Please don't turn it into a catalogue.

*Enver Berkes  
Winnipeg, Manitoba  
Canada*

## Who's Right?

Because I'm always looking for tips on speeding up my little 20MHz Tandy 2500SX, I enjoyed your "Maximum DOS" issue [Special #4, June 1994]. I've found a couple of sources, however, that contradict Stan Miastkowski's contention that "a disk cache is even faster and more versatile than a RAM disk" ["Tuning Up SmartDrive," page 30].

In discussing optimization of a computer for database management, *PC Secrets* says, "Your safest approach is to use a disk cache rather than a RAM disk, despite the marginal speed degradation." The MS-DOS user's guide states, "On most [italics are mine] computers, SMARTDRV improves speed more effectively than a RAM disk." What gives?

On another note, I'm trying to locate an algorithm with a counter that would print sorted lottery numbers to a file on disk. Can anybody in *DOS World* land tell me where to find such a program?

*David Fisher  
Fairmont, W. Va.*

*People who perform a variety of tasks using a variety of complex programs (word processors, database managers, and spreadsheets with numerous modules, for instance) are usually better off using a disk cache. In situations such as these, a disk*

*cache is more versatile and efficient, because you don't have to worry about making sure the right software is in memory when you move from task to task. The disk cache handles everything for you, keeping the most recently used information in memory as you work.*

*If you rely on a limited number of relatively simple programs, however, and you're certain that you won't need any other program during a particular computing session, a RAM disk is a better option. The right programs will be in memory at all times, so you'll achieve a 100-percent hit rate.*

—Eds.

## The Good and The Unacceptable

Your issue "Running DOS and Windows in Harmony" [Special #3, February 1994] should be in every PC user's reference library. Why? Because the information presented, especially the tips, will not only improve PC productivity, but also Windows' usability. This issue merits four gold stars.

The Shareware Companion Disk for this issue, however, deserves a half star at best. None of the programs is praiseworthy or warrants continued use. Registration is out of the question.

*E. Jean Wilson  
Washington, D.C.*

## Staying Alive in BOMBER.BAS

I like Doug Lowe's program BOMBER.BAS ["Mad Bomber," *DRG/DOS World* #17, September 1994, page 56] because it has several elements important to any good strategy game. First, it challenges you to use your mind in a new way, and



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it's fair—except for the 1-in-15 chance of losing on the first move. Moreover, it's fun, and it looks good, too.

I have a simple fix for dealing with the 1-in-15 chance of losing on the first move. To begin with, the subroutine INITIALIZEGAME contains a piece of deadweight. In the line IF GRID (X, Y) = 0 AND GRID (X, Y) <> 11 THEN, everything following AND is meaningless, because if GRID (X, Y) is equal to zero, it can't be equal to 11. Using this line instead will make the game fairer:

```
IF GRID (X, Y) = 0 AND (X + Y)
  > 2 THEN
```

This prevents a bomb from being placed in grid (1,1), so it's always safe to begin by pressing Enter. If you prefer, you can write this line instead as follows:

```
IF GRID (X, Y) = 0 AND (X + Y)
  > 3 THEN
```

to ensure safe passage out of the corner. After that, you're all on your own.

Tom Sales  
Somerset, N.J.

*Thanks for the kind words about BOMBER.BAS. You're right about the deadweight, of course. Good catch! Your solution to eliminating the 1-in-15 chance of exploding on the first move works, but it clears grid locations (1,2) and (2,1). As a result, players have three safe moves at the beginning of the game. In addition, if the first move at (1,1) reveals a 1, the player knows for sure that a bomb is located at (2,2). A similar solution is to change the IF statement to the following:*

```
IF GRID (X, Y) = 0 AND X * Y = 1 THEN
```

*With this approach, the first square, (1,1), is always clear (X \* Y will equal 1 only if both X and Y are 1), but (1,2), (2,1), and (2,2) may contain bombs. Of course, if the*

*first move at (1,1) turns up a bomb, you have a 1-in-3 chance of dying on the next move if you pick one of the adjacent squares. The proper strategy in this case is to skip those cells and pick another nearby cell [such as (1,3)] in an attempt to gather more information.*

—Doug Lowe

## Not So Fast

Regarding "MOVE Over, COPY" [DRG/DOS World #15, May 1994, page 36], I agree that in most instances MOVE provides the easiest and fastest way to relocate files. But I experienced an extreme decrease in speed while using MOVE. With DoubleSpace, I first compressed a 1.44MB floppy disk and changed the compression ratio to 16:1.

My hard disk contained a directory called \ICONS, which holds hundreds of icons. My intent was to move the entire directory to the compressed floppy disk.

After typing MOVE C:\ICONS\\*.\*, I left my computer running for well over two hours while the files were transferred to the floppy disk. A simple XCOPY command would have copied the files in a matter of minutes or seconds. DOS users should consider the file and media type before executing MOVE. Transferring files from hard disk to floppy can make for slow moves, which XCOPY could cure easily.

Alan Hume  
Oklahoma City, Okla.

## OMISSIONS AND CORRECTIONS

### Do You Hear What I Hear?

Readers looking to obtain the PC Speaker driver mentioned in Kay Yarborough Nelson's tip "Play Sounds Without a Sound Card" ["Running DOS and Windows in Harmony," DRG/DOS World Special #3, February 1994, page 23] will find that the number printed there is no longer in service.

According to Microsoft Corp.'s sales and customer-service depart-

ment, there are two ways you can obtain the PC Speaker driver, SPEAK.EXE. (Remember, you must run Windows to use this program.) You can call the sales department at 800-426-9400; from a touch-tone phone, choose option 4 for product and sales information; choose 4 again for "information on other Microsoft products"; order SPEAK.EXE from the representative who answers. Or you can dial Microsoft's downloading service (between 5 AM and midnight Pacific time) with your modem: 206-936-6735 (8-N-1). You pay only the toll charge. —Eds.

### One Pause Too Many

Robert de Vlam's DOSKEY commands for editing AUTOEXEC.BAT and CONFIG.SYS ["Tips from Readers," DRG/DOS World #16, July 1994, page 7] are great, but CON, a macro that types information to the screen, contains an error: It uses both MORE and PAUSE. The MORE filter is sufficient; you may omit \$T PAUSE:

```
DOSKEY CON=TYPE CONFIG.SYS $B MORE
```

K.A. Lane  
Sacramento, Calif.

### A Prettier Picture

I have a suggestion for improving the QBasic menu maker QBMENU.BAS ["Menus à la Carte," DRG/DOS World #16, July 1994, page 40]. In the section of the program labeled :PROMPT, change this line:

```
VIEW PRINT: GOSUB MENUBAR: RETURN
```

as well as the program's last line to read as follows:

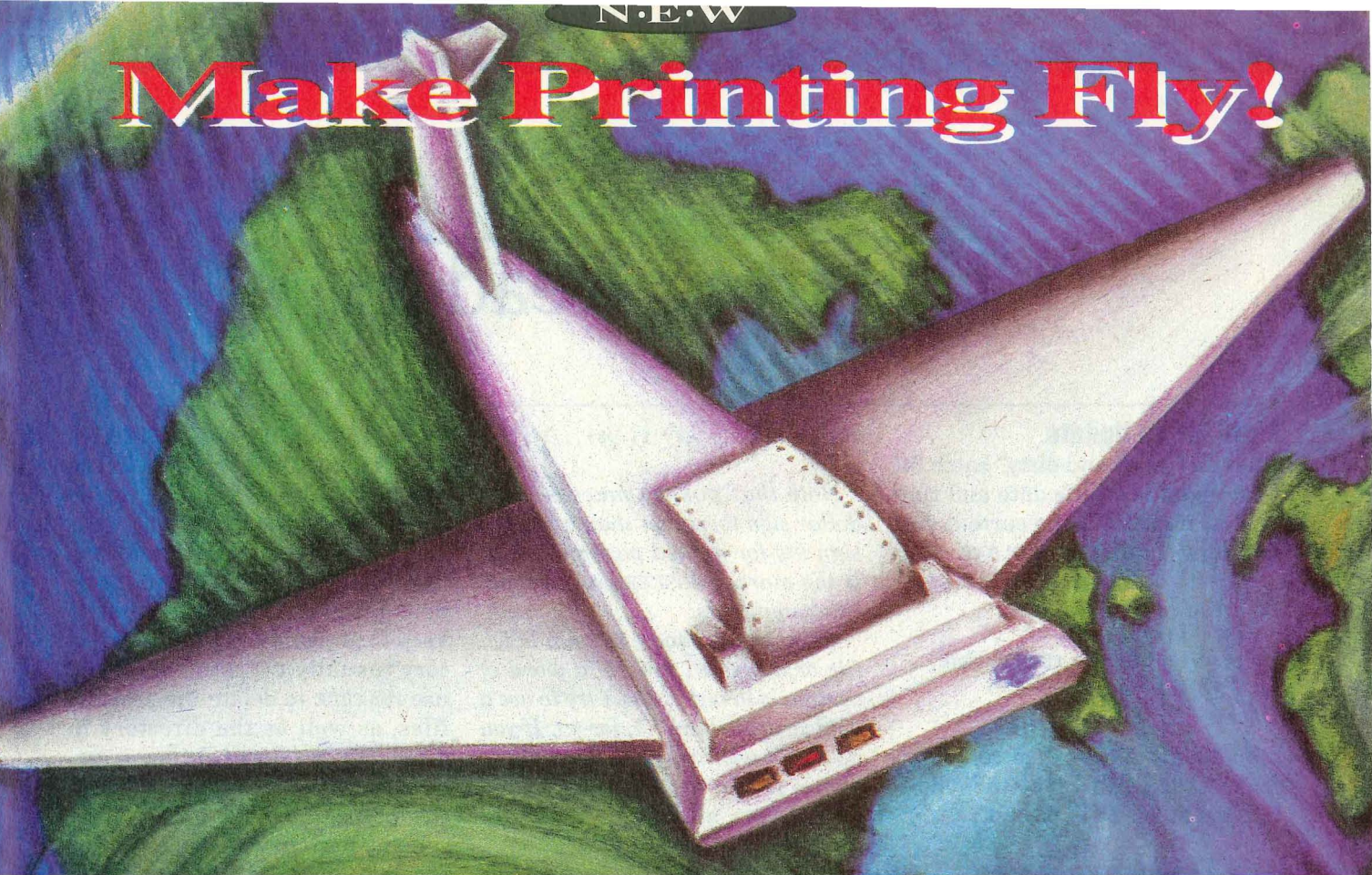
```
VIEW PRINT: CLS: COLOR 15,1:
GOSUB GETPIC: GOSUB MENUBAR:
RETURN
```

Changing these lines makes the program redraw the screen and menu bar, for a nicer-looking display.

Shaun Cooley  
Redondo Beach, Calif.



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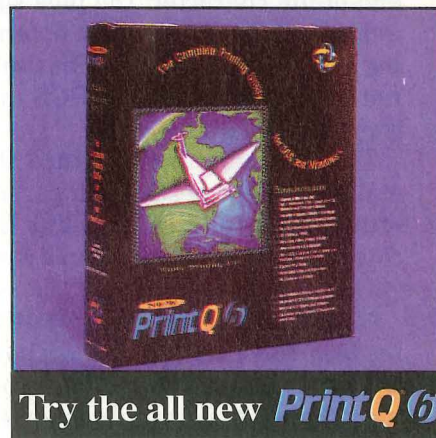
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# Tips from Readers

## Time for an Update

I have a "quick and dirty" batch file that updates a file's date and time so that it matches the current date and time. I call it REDATE.BAT:

```
@ECHO OFF
COPY %1 /B+,,/Y >NUL
ECHO %1 now has the current
    date/time stamp.
```

To update a file called TODAY.DAT, for instance, you'd type the following line at the DOS prompt:

```
REDATE TODAY.DAT
```

Note that %1 refers to the second command-line parameter, which in this case is TODAY.DAT. /B tells DOS to copy the entire file, including the end-of-file character; the plus sign indicates to DOS that you're appending several source files to one destination file, which tricks DOS into copying a file over itself.

The two commas indicate the omission of the destination parameter, which tells DOS to put the copied file back where it came from (%1).

/Y indicates that you want to replace the existing file without DOS prompting you for confirmation. The >NUL command suppresses COPY's "1 file(s) copied" message.

Michael Bennett  
Halifax, Nova Scotia  
Canada

To accomplish this a bit more efficiently, you may use the second line of the program as the basis of a DOSKEY macro. If you want to name the macro REDATE, the appropriate DOSKEY line should read:

```
DOSKEY REDATE=COPY $1 /B+,,/Y >NUL
```

*Note that DOSKEY macros use a dollar sign (\$) rather than a percent sign (%) for named parameters. \$T is the marker DOSKEY uses to separate commands.*

*Whether you choose to use a batch file or a DOSKEY macro, a word of caution is in order: Don't try to use a wildcard, such as \*.\* for %1. If you do, DOS will copy all files whose names match the file specification (in this case, all files in the current directory) into one file.*

—Eds.

## A Better Solution

A few months ago, Guy Standing wrote to inquire how to delete a file that included a pipe symbol (|) ["The Down Side of Upgrades," DRG/DOS World #15, May 1994, page 66]. "Start-Up Clinic" columnist Jack Nimersheim's suggestion to delete it from Windows' File Manager doesn't always work: Sometimes you get a "File not recognized" or "File does not exist" message.

I usually get such ill-named files by unzipping programs in Windows using a Windows shell program for PKWARE's PKUNZIP. BBSes often add special ANSI.SYS displays to files to advertise their systems. Apparently, Windows doesn't expect these sorts of antics and frequently captures the displays and assigns the files peculiar names that use the keyboard symbols for the ANSI.SYS codes.

I don't like using Windows to do DOS's work, so when I encounter a file that includes a strange character, I first try using the RENAME command to change the filename.

Unfortunately, it's not 100-percent effective, but DOS 6.x offers a command that always works for me in these situations: DELTREE.

Whenever I encounter several filenames DOS won't rename or delete, I move the files I want to keep to an empty temporary directory (usually C:\TEMP) and then use DELTREE to delete the problem files, as well as the directory in which they're stored. I then recreate the original directory and move the "keepers" into it.

If you encounter filenames with problem characters while working in Windows' File Manager, first try highlighting each file and deleting it, as Jack Nimersheim suggests. If Windows gives you an error message, try using the File menu to rename and delete it.

If that doesn't work, you'll have to move the good files to a new directory, delete the directory containing the files you don't want, recreate the directory, and move the good files back into it. But first, open the Options menu and click on Confirmation. Uncheck the box for Directory Delete. If you don't, File Manager will request confirmation before deleting each file and spew out an error message when you tell it to proceed.

I find it much simpler to work from DOS when dealing with problems of this type. DELTREE warns you once that the directory and its contents will be deleted, which is exactly the message you want.

Robert C. Casas  
Glenview, Ill.

## Super Search, Super Cheap

Regarding your guide to super DOS utilities [DRG/DOS World



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—Jerry Pournelle,  
BYTE Magazine, May 94



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## TIPS FROM READERS

#16, July 1994, page 48], I have a simple alternative for commercial file-search programs: a DOSKEY macro that lets you locate a file on your hard disk and get the complete rundown on that file's attributes. It looks like this:

```
DOSKEY GET=CLS $T ATTRIB \ $1 /S
```

When the macro is stored in memory, you can find a file simply by typing `GET file-name.ext` at the DOS prompt. The `GET` command clears the screen and searches for the file you name, beginning in the root directory and looking for the file in all subdirectories below the root.

This DOSKEY macro accepts wildcards such as `*.DOC` and `TAX*.*`.

*Robert de Vlam  
Ouderkerk-Amstel  
Netherlands*

*If you use GET with wildcards such as \*.BAK, chances are that some of the filenames will scroll off screen before you can read them. You can eliminate this problem by typing \$B MORE at the end of the DOSKEY command:*

```
DOSKEY GET=CLS $T ATTRIB  
\ $1 /S $B MORE
```

—Eds.

### More DOSKEY Macros

I'd like to add my macros to those provided by Robert de Vlam and Bob Rhodes in the July 1994 issue

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[*DRG/DOS World* #16, "Tips from Readers," page 7].

To prevent important information from scrolling away off the screen when I call the `TYPE` command, I use this macro to ensure that DOS pauses after each screen:

```
DOSKEY TYPE=TYPE $1 $B MORE
```

When you type `TYPE LETTER.NOV`, for example, DOS interprets the above command as:

```
TYPE LETTER.NOV | MORE
```

I've improved on Rhodes's macro for displaying a list of active macros by adding a `SORT` command to present the list in alphabetical order:

```
DOSKEY H=DOSKEY /M $B  
SORT $B MORE
```

Among the macros I use to save keystrokes are the following:

```
DOSKEY X=EXIT  
DOSKEY \=CD\
```

When I've temporarily "shelled" to DOS from within a program such as Windows, the first macro lets me type `X` to get back to the program I was using before. The second macro lets me get back to the root directory by typing a backslash.

In addition, I use handy DOSKEY commands to start almost all my programs.

There's only one problem with this approach. I have DOS version 6.2, so if I press `F8` to step through my `CONFIG.SYS` and `AUTOEXEC.BAT` files, I just have to remember to answer no when DOS asks whether to execute the line for loading the batch file containing my DOSKEY macros. Otherwise, DOS requires me to verify every macro in my lengthy list.

*K.A. Lane  
Sacramento, Calif.*

**DOS  
TIP**

## DOSSHELL À LA MODE

If you frequently use the DOS Shell (`DOSSHELL.EXE`) for tasks such as file management, but have never bothered to investigate improving the default display mode, you may be doing yourself a disservice. If you type `DOSSHELL /G` when calling the Shell, DOS runs the program in graphics mode, using the highest resolution supported by your video hardware. Admittedly, `DOSSHELL`'s graphics mode isn't very graphical, but it may help if you can see drive icons instead of merely drive letters, as well as icons preceding each directory entry to indicate whether it's a data or a program file.

You may view other options by typing `DOSSHELL /?` at the DOS prompt, but it's more rewarding to check out the possibilities from within `DOSSHELL`. To do that, open the Options menu, and select Display. The dialog box that appears lets you choose text or graphics mode as well as low, medium, or high resolution. To select monochrome reverse video (white text on a black background) or one of three color schemes, use the Option menu's Colors selection.

—Jack Nimersheim



# Best of the Batch

## ANSI.SYS Color Combinations

The colors offered by DOS's ANSI.SYS device driver are easy to add to batch files, but the required codes aren't worth memorizing. As a result, most people don't use color at all.

COLOR.BAT (shown below) is the solution. When you type COLOR, the batch file displays a screen consisting of three columns. The first shows

the required escape sequences for foreground colors; the second column lists background colors; and the third column lists the text-formatting options bold, blinking, reverse type, and "hidden" (prevents text display).

A second screen shows you the various color combinations you can get with the escape sequences displayed in the first screen. This one

lets you see the colors of your choice so that you can decide whether you like them. For example, cyan (light blue) text on white is barely readable, but cyan text on blue (a dark shade) looks very nice.

COLOR.BAT also explains the ANSI.SYS escape code and how to enter it in DOS's text editor, EDIT.COM, to create the color effects you're after.

**COLOR.BAT comes in handy when you're doing ANSI.SYS color programming; it displays a list of escape sequences for foreground and background hues and text-formatting options, as well as the actual color combinations themselves. To create the escape character ← in EDIT.COM, press Ctrl+P, then Escape.**

```
@ECHO OFF
REM D:\BAT\COLOR.BAT
CLS
ECHO ←[mANSI.SYS GRAPHICS AND TEXT OPTIONS←[0m
ECHO (Ctrl+P, Esc = "escape" (E) sequence character)
ECHO.
ECHO ←[mTEXT COLORS BACKGROUND COLORS TEXT FORMAT←[0m
ECHO.
ECHO E[30m ←[7mBlack←[0m E[40m ←[37mBlack←[0m
E[1m ←[1mBold←[0m
ECHO E[31m ←[31mRed←[0m E[41m ←[41mRed←[0m
E[5m ←[5mBlinking←[0m
ECHO E[32m ←[32mGreen←[0m E[42m ←[42mGreen←[0m
E[7m ←[7mReverse←[0m
ECHO E[33m ←[33mYellow←[0m E[43m ←[43mYellow←[0m
E[8mHidden
ECHO E[34m ←[34mBlue←[0m E[44m ←[44mBlue←[0m
ECHO E[35m ←[35mMagenta←[0m E[45m ←[45mMagenta←[0m
ECHO E[36m ←[36mCyan←[0m E[46m ←[46mCyan←[0m
ECHO E[37mWhite←[0m E[47m ←[7mWhite←[0m
ECHO.
ECHO ←[mSyntax:←[0m ←[7mE[#;#mYour MessageE[0m←[0m
ECHO.
ECHO Where letter "E" represents key combination
of Ctrl+P then ESC key. It will
ECHO appear in your batch file as a small arrow
pointing left. (ASCII 27)
ECHO.
ECHO ←[mExample of text as entered into a batch
file for following display:←[0m
ECHO ←[1m2.←[0m E[31;44mHelloE[0m
Is red on blue ←[1;31;44mHello←[0m
ECHO.
PAUSE
CLS
```

```
ECHO ←[1mSample Color Schemes←[0m
(see first screen for color text samples on black)
ECHO 41 ←[41;30m30B1←[0m ←[41;32m32Gr←[0m
←[41;33m33Ye←[0m ←[41;34m34Bl←[0m
←[41;35m35Mag←[0m ←[41;36m36Cya←[0m
←[41;37m37Whi
ECHO ←[0m
ECHO 42 ←[42;31m31Re←[0m ←[42;30m30B1←[0m
←[42;33m33Ye←[0m ←[42;34m34Bl←[0m
←[42;35m35Mag←[0m ←[42;36m36Cya←[0m
←[42;37m37Whi
ECHO ←[0m
ECHO 43 ←[43;31m31Re←[0m ←[43;32m32Gr←[0m
←[43;30m30B1←[0m ←[43;34m34Bl←[0m
←[43;35m35Mag←[0m ←[43;36m36Cya←[0m
←[43;37m37Whi
ECHO ←[0m
ECHO 44 ←[44;31m31Re←[0m ←[44;32m32Gr←[0m
←[44;33m33Ye←[0m ←[44;30m30B1k←[0m
←[44;35m35Mag←[0m ←[44;36m36Cya←[0m
←[44;37m37Whi
ECHO ←[0m
ECHO 45 ←[45;31m31Re←[0m ←[45;32m32Gr←[0m
←[45;33m33Ye←[0m ←[45;34m34Bl←[0m
←[45;30m30B1k←[0m ←[45;36m36Cya←[0m
←[45;37m37Whi
ECHO ←[0m
ECHO 46 ←[46;31m31Re←[0m ←[46;32m32Gr←[0m
←[46;33m33Ye←[0m ←[46;34m34Bl←[0m ←[46;35m35Mag←[0m
←[46;30m30B1k←[0m ←[46;37m37Whi
ECHO ←[0m
ECHO 47 ←[47;31m31Re←[0m ←[47;32m32Gr←[0m
←[47;33m33Ye←[0m ←[47;34m34Bl←[0m
←[47;35m35Mag←[0m ←[47;36m36Cya←[0m ←[47;30m30B1k
ECHO ←[0m
```

End



## BEST OF THE BATCH

Here's an example of how to use COLOR.BAT to create a batch file that displays red text on a blue background. First, type COLOR and look at the three columns of display options in the opening screen. Note that the first is text; the second is background. The number for red text is 31; for a blue background, 44.

Now type EDIT TEST.BAT and press Enter. The first line of your batch file should be @ECHO OFF. For line 2, type ECHO and then press the spacebar. Now press Ctrl+P, then Escape. You should see a small

arrow pointing left. Type the following string:

```
[31;44mHello
```

Press Ctrl+P and Escape again; then type [0m.

Line 2 should look like this:

```
ECHO ←[31;44mHello←[0m
```

Save the TEST.BAT batch file (Alt+F, S) and exit EDIT.COM (Alt+F, X). Whenever you run TEST.BAT, *Hello*

should appear in red type on a blue background.

Now let's make *Hello* blink. In column 3 of the opening screen, you can see that the escape sequence for blinking is [5m. Type that sequence immediately before the word *Hello*, so that line 2 of TEST.BAT looks like this:

```
ECHO ←[31;44m←[5mHello←[0m
```

*Walter J. Hofman  
Woodbridge, Ontario  
Canada*

**DOS  
TIP**

## SOME LIKE IT WARM

Most of the time when you need to restart your system, you can simply press Ctrl+Alt+Del or reach for your system's Reset button. Sometimes, though, this hands-on approach doesn't work—for example, when you're accessing a remote computer via modem from your local machine. For those occasions, you need a program to handle reboots—two programs in fact, because PCs have two types of reboots: warm and cold. Pressing Ctrl+Alt+Del initiates a warm reboot; when you press the reset button, you're doing a cold reboot.

A warm reboot works if you just want to change your system's configuration. But because it may not do a complete wipe of protected-mode memory, it doesn't always help you recover from a crash or load an alternate operating system. A cold reboot clears all memory registers and makes the machine execute its power-on self-test and diagnostics.

When you need to do a warm reboot and a hands-on approach won't do, use WARMBOOT.COM, an executable program created from the Debug script WARMBOOT.SCR (below left). For cold reboots, convert COLDBOOT.SCR (below right) to COLDBOOT.COM. Creating the scripts is easy: Using an editor that saves files in ASCII (text) format,

type in each listing exactly as written, making sure to include the blank line in each program. To compile the scripts in executable format, use the DEBUG command.

For example, to compile WARMBOOT.COM in the current directory, you'd type this line:

```
DEBUG < WARMBOOT.SCR
```

With WARMBOOT.COM and COLDBOOT.COM on hand, you can write batch files that automate your rebooting chores. The following batch file, for instance, copies the contents of the current CONFIG.SYS and AUTOEXEC.BAT files to AUTOEXEC.SAV and CONFIG.SAV, copies new files over AUTOEXEC.BAT and CONFIG.SYS, and reboots:

```
COPY CONFIG.SYS CONFIG.SAV
COPY AUTOEXEC.BAT AUTOEXEC.SAV
COPY CONFIG.1 CONFIG.SYS
COPY AUTOEXEC.1 AUTOEXEC.BAT
WARMBOOT
```

—Lenny Bailes

**Use this Debug script, WARMBOOT.SCR, to create the executable program WARMBOOT.COM, which lets you perform a "warm" reboot without pressing Ctrl+Alt+Del.**

```
N WARMBOOT.COM
A 100
MOV AX,0040
MOV DS,AX
MOV WORD PTR [0072],1234
CLI
JMP F000:FFF0

R CX
11
W
Q
```

*End*

**Use this Debug script, COLDBOOT.SCR, to create the executable program COLDBOOT.COM, which lets you perform a "cold" reboot without pressing your computer's Reset button.**

```
N COLDBOOT.COM
A 100
MOV AX,0040
MOV DS,AX
MOV WORD PTR [0072],FFFF
CLI
JMP F000:FFF0

R CX
11
W
Q
```

*End*



## READER FORUM

# Hardware Brain Teasers

by Hardin Brothers

I got my first "computer" on my 12th birthday. Actually, it was a set of flexible, complex switches made of circles of Masonite, connected by small bolts, nuts, and wire. It all came in a cardboard box labeled "Brainiac." Although Brainiac didn't have any CPU at all, its manual did a remarkable job of explaining how to make those switches add two-digit numbers, play tic-tac-toe, and perform other computer-like activities. Brainiac also stimulated my interest in electronic and computer hardware. Although I like working with software and writing about it, I enjoy learning about my computers' underlying hardware even more. So I'm especially pleased this month to answer a pair of hardware questions.

## Changing Colors

The first question this month comes from Frederick Sohn of New York City:

*Display colors are mixtures of three primary colors; you can define each of the 16 colors available at any one time. Is there a utility that can do the job?*

To be truly effective, the utility program Mr. Sohn wants would have to monitor all video requests to intercept mode changes, or it would have to reload the palette and DAC (digital-to-analog converter) registers each time you returned to DOS from an application program and each time you shelled to DOS. (In this case, a *register* is one or two bytes of special memory on the video adapter.) In addition, it would have to take special precautions to avoid mess-

ing up Windows' colors whenever you switched to a DOS session under Windows. None of this is impossible, but it can't be done in a short Debug script. A little background shows why it's a complex situation, requiring a long and involved program.

Whether you're at the DOS prompt or in Windows, your monitor displays any text or graphics as a series of dots. Your video card creates the dot information and sends it to the monitor as a series of electrical pulses. The colors you see on screen are a result of the capabilities of both the video card and the monitor.

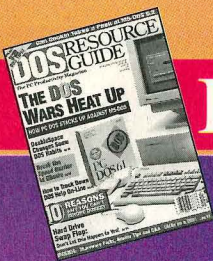
The CGA (color/graphics adapter) in the original PC and PC/XT has four data wires running from the adapter to the monitor: one each for red, green, and blue, plus one for "intensity." The system can combine these four signals to produce 16 colors. Because of this limitation, the character-mode text buffer allots enough space for 16 values for foreground and 16 values for background "attributes" per character on screen.

The EGA (enhanced graphics adapter), released in 1985, has six data lines running from the adapter to the monitor: two each for red, green, and blue. In each pair, one line is for "low intensity" and one line is for "high intensity" dots of the given color. The system can combine the signals on these six lines to create 64 colors. The EGA uses an internal table to translate each of the 16 "attribute" numbers into one of its 64 possible colors. When the system initializes the EGA, it loads the table with the values that will match those output colors to the CGA's as closely as possible.

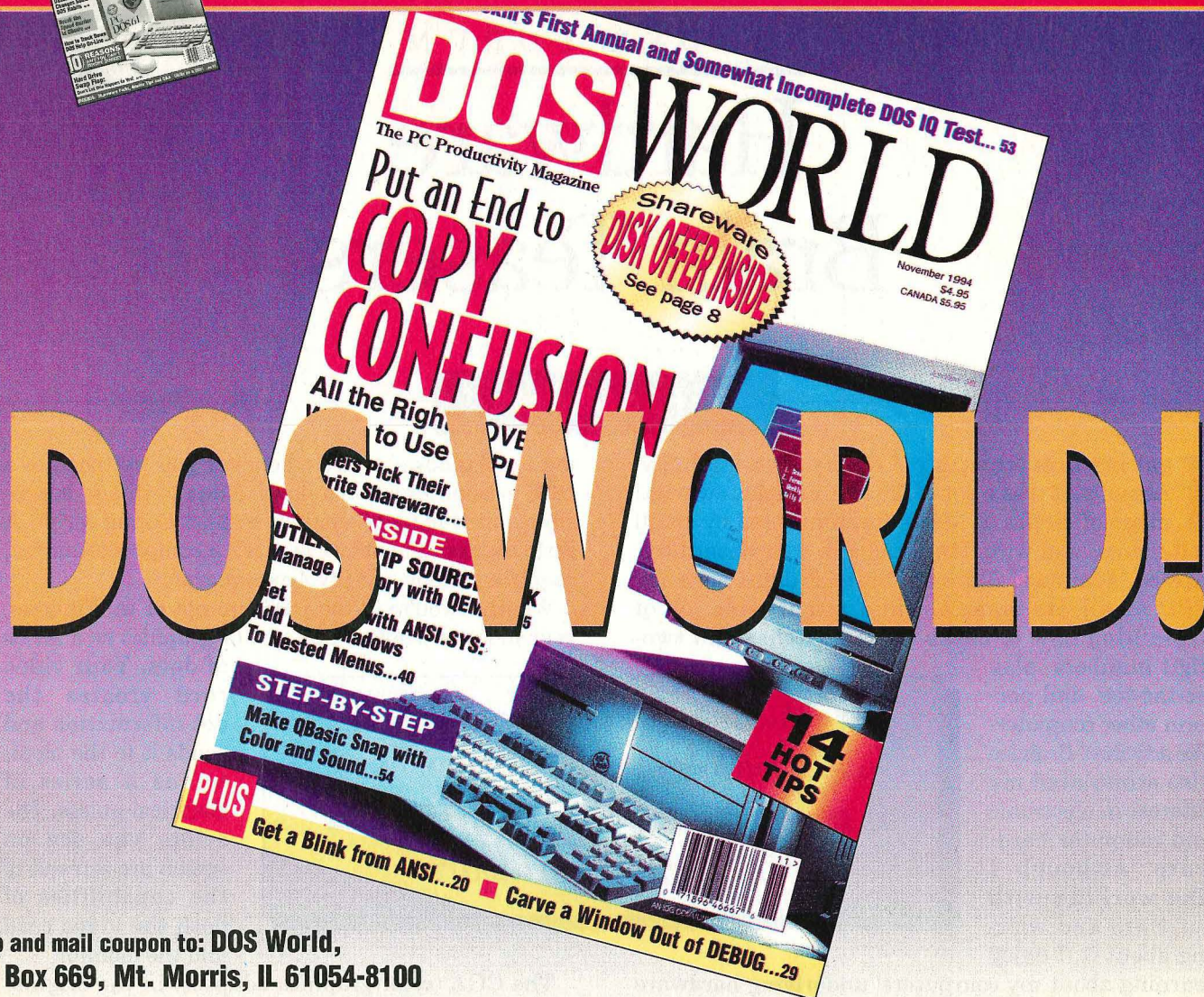
The MCGA (multicolor graphics array) in the IBM PS/2 Models 25 and 30 and the VGA (video graphics

*Although I like working  
with software, what I enjoy most  
is exploring my computer systems'  
underlying hardware.*





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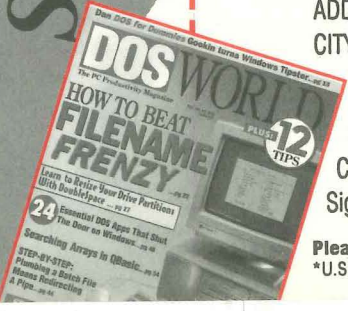
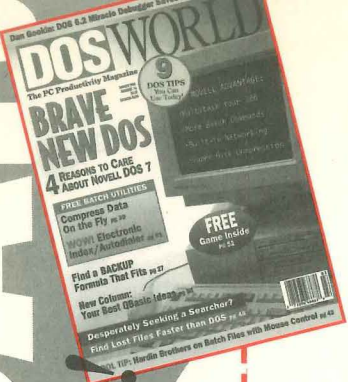
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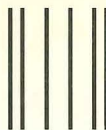
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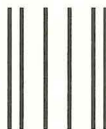
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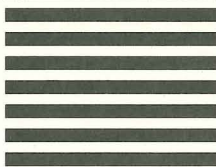
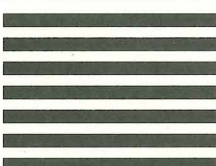
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rray) in current PCs and PC compatibles can display 62,144 different colors. If IBM had continued the tradition of using digital (on/off) color lines, both video cards would need a cable with 18 data lines plus an assortment of control lines. Such a cable would be unreliable and too thick to bend easily around corners.

Instead, these video cards and their descendants use three analog data lines, one for each primary color. The voltage in each line determines the color displayed for each dot on screen. Of course, these adapters require a monitor that can accept analog signals.

In the MCGA and VGA, an attribute number (from 0 to 15) selects a palette register, which contains a number that selects one of 256 video DAC register numbers. The three color values in that register are translated into three voltage signals that determine the output color. By manipulating the palette and DAC registers, you can make any attribute value (from 0 to 15) represent any color the adapter and monitor can display on an MCGA or VGA system. It requires some assembly language (which you can write with Debug), but it's not difficult.

The problem is that the palette and DAC registers are reloaded with their default values every time your system resets the video card. And resets occur frequently: each time a program switches between graphics and text modes, each time a program changes from one text mode to another or from one graphics mode to another, and, in some programs, every time the screen clears. Perhaps a *DOS World* reader can suggest a shareware or commercial program that lets users change from the standard 16 colors.

## How Does My Disk Drive?

In *DRG/DOS World* #14 (March 1994), I presented a technique in "Batch-File Medic" (page 43) called BATMOUSE.COM, which adds mouse control to batch files. To add mouse input to a batch file, you call BATMOUSE.COM over and over in a loop until you click one of the mouse buttons. BATMOUSE.COM then sends the necessary information to the batch file so that it can determine where the mouse cursor was when you clicked the button. Matthew King of Berlin, Germany, asks:

*What happens if you start BATMOUSE.COM in a menu program and then walk out of the room? How long will it be before the continual hard-drive reads destroy the hard drive? A few hours?*

In this case, Mr. King's fears are groundless. It takes no more work for the drive to spin and do nothing than it does for it to read and write data. The only difference is that the heads might need to move to a new section of the disk before a read or write operation.

In addition, BATMOUSE.COM is only about 200 bytes long. If you're using a disk-cache program like Smart-

Drive, or even if you've set your DOS buffers to a reasonable number, your system reads the program into memory only once and then retrieves it from the cache or buffer each time it needs it.

If you store BATMOUSE.COM on a floppy disk, however, and the computer physically reads the disk each time it needs the program, then you have cause for concern. Floppy disks and drives suffer wear and tear during every data access. If you use floppy disks for programs you load and run over and over, think about moving those programs to a RAM disk.

Reading data from the hard drive won't cause mechanical, magnetic, or even electronic wear. Your hard drive will last just as long whether you read data from it or just leave it spinning while your computer is on.

Inside every hard drive is a stack of magnetic platters. Above each platter is a read/write head, capable of reading magnetic pulses from the platter or writing new magnetic information on it. When your hard drive is on, all the platters spin in unison, and all the heads move in or out together, searching for the correct area of the disk to read or record new data.

Unless you use a battery-powered computer or a new "green" computer with power-saving features, your hard drive spins whenever your computer is on. It doesn't stop until you turn off the power. If the read/write heads rubbed on the platters, they'd soon wear off the thin magnetic coating that holds your data. But the heads float above the platters on small cushions of air, only a few microns thick—smaller than a human hair or a particle of smoke.

To keep contaminants from getting caught between the heads and platters, the hard drive contains an air filter. If the heads ever do touch the platters, or if a contaminant gets caught between the head and the platter, the result is a "head crash": A section of the magnetic material is scratched off the drive and will no longer hold data reliably. ■

*Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years.*

## Want to Know More?

*If you have a question, or need further help with something that has appeared in DW, write:*

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*Please include a copy of your AUTOEXEC.BAT and CONFIG.SYS files on disk if you have particular problems with software or hardware conflicts and compatibility.*



## CRISIS MANAGEMENT

# Disaster Averted

*Stay cool, don't panic, don't punch the machine:  
Our time-tested tips will help you prevent a computing  
mishap from becoming an all-out nightmare.*

by Kay Yarborough Nelson

**T**he disasters you're about to witness happen every day. If you're lucky, none of them has befallen you—yet. But just in case, tear out this article and post it on your wall—because when calamity strikes, you'll appreciate having a few pointers on emergency procedures. The last thing you need during a crisis is to have to scan several manuals in search of a solution.

And remember, don't panic. Most computing problems—apart from hardware malfunctions—are relatively simple to fix. Take these typical mishaps, for example: a system that freezes at start-up; the appearance of an "Invalid drive specification" message when you try to access your hard drive; the sudden onset of a viral infection; the "disappearance" of important files. If you understand what's going on and know which tools can set things straight, you can keep an unexpected problem from becoming

a catastrophe. In addition, following the routine measures suggested in the "Ounce of Prevention" sidebars (pages 19, 20, and 21) will go a long way toward keeping these and other potential disasters from ever darkening your screen.

## **I Started My System the Way I Always Do, and It Just Froze**

There are several possible explanations for this common phenomenon. Sometimes your keyboard simply stops responding to input during start-up; for no apparent reason, the electricity loses its way while traveling from the keys to the screen. Even pressing Ctrl+Alt+Del has no effect.

The fix is simple: Press your computer's Reset button (on the front of the unit in most models). If that doesn't work, you'll have to turn off your system and restart it. You can't recall a keyboard from electronic limbo.

But if your system freezes again when you reboot, something else is wrong. The most likely cause is that you, or the last program you installed, modified your CONFIG.SYS or AUTOEXEC.BAT file (or both). The new com-

mands either conflict with other commands or are just plain incorrect.

MS-DOS 6.x offers two ways to circumvent this problem. When you hear DOS's start-up beep, press F5 to bypass both CONFIG.SYS and AUTOEXEC.BAT. Or press F8 to tell DOS to pause before executing each CONFIG.SYS command that loads drivers or programs into memory. Starting with DOS 6.2, pressing F8 steps you through both CONFIG.SYS and AUTOEXEC.BAT.

If you think this can't happen to you because you're too experienced, let me tell you that it has happened to me twice. (I just don't learn, it seems.) I used Windows to install the wrong video driver, and the next time I started the system, I couldn't see anything on screen. Windows apparently changed my CONFIG.SYS and AUTOEXEC.BAT, as well as its own SYSTEM.INI file. To get back on track, I skipped over CONFIG.SYS and AUTOEXEC.BAT, used Edit (EDIT.COM) to delete the offending lines from my start-up files and SYSTEM.INI, and then rebooted.

In this case, I knew what I'd done. In many cases, though, you won't know what's causing the

*Kay Yarborough Nelson is the author of Voodoo DOS and Voodoo Windows (Ventana Press), as well as Lotus 1-2-3 Answers (Osborne/McGraw-Hill).*



problem, so you'll have to isolate it. First, figure out where the problem lies by pressing F5 on start-up. If your system doesn't start even when you bypass CONFIG.SYS and AUTOEXEC.BAT, you have a hardware problem. Turn off your system and check to make sure the keyboard connector, power cord, monitor plugs, and drive cables are properly seated. If this has no effect, consult your system's manufacturer or a local computer-repair company for further advice.

If your computer boots when you press F5 on start-up, the problem lies in either AUTOEXEC.BAT or CONFIG.SYS. To pinpoint which line (or lines) in these programs is at fault, follow these steps:

- Restart your system, pressing F8 after you hear the beep.
- Type Y to execute each line in CONFIG.SYS, but type N when DOS asks whether to run AUTOEXEC.BAT. If your system freezes again, the problem lies in CONFIG.SYS.
- Test each line in CONFIG.SYS by restarting, pressing F8, and typing Y for the line you're testing and N for all others. Be sure, however, to type Y when DOS asks you about the commands for HIMEM.SYS and EMM386.EXE and the DOS=HIGH,UMB line. Also, if you've added any hard-disk drivers your system needs, don't disable them. (See the manual that came with your hard disk to figure out which lines those are.) When your computer won't start, you've identified a command that's preventing you from booting up.
- Figure out how to fix the problem line. If you don't see an obvious syntax error, you may need to update the program itself. Contact the manufacturer of the program that won't work and ask for advice on eliminating the difficulty.
- To disable the offending line, place a REM statement at the begin-

ning of the line that's causing the problem; then save CONFIG.SYS and restart your computer. But don't stop testing; CONFIG.SYS may contain more than one troublesome line.

If you don't turn up any problems in CONFIG.SYS, you'll need to put AUTOEXEC.BAT through its paces. If you have DOS 6.2 or later, the procedure is similar to the one you used with CONFIG.SYS:

- Press F8 after you hear the start-up beep.
- Type N to bypass CONFIG.SYS and Y to run AUTOEXEC.BAT.
- Step through your AUTOEXEC.BAT, testing one line at a time. As with CONFIG.SYS, however, let DOS execute certain lines while you're testing. For instance, don't put REM statements in front of your ECHO OFF, PROMPT, and PATH commands.

If you have an earlier version of DOS, the process is more labor intensive. Because pre-6.0 DOSes don't have interactive testing capability, you must boot from an emergency floppy disk. (See "How to Use This Magazine," page 76 in this issue, for instructions on making one.)

Then you must isolate the line you're testing by prefacing with

REM statements the lines in CONFIG.SYS and AUTOEXEC.BAT that you *aren't* testing.

Finally, you have to save the revised version of the start-up file you're testing and restart your system. When you can't boot your computer, the line you just tested is incorrect. If you can run your computer without that line, preface it with REM until you can figure out how to fix it.

As with the interactive testing method, you should continue testing lines until you're certain you've located all the trouble spots.

### **My Bootup Was Always OK, but Now I Get "Invalid Drive Specification"**

This missive can mean several things. With luck, you merely typed the letter of a drive you don't have or the drive's cable connector has come loose. Unfortunately, however, it can also mean that the disk's file-allocation table (FAT) is damaged, either because the surface of the disk is marred or because write errors have scrambled information on the disk. The FAT tells DOS where everything is, and if DOS can't read this table, it can't find anything. Normally, DOS keeps its own backup copy of the FAT, which a disk utility can retrieve if the table is ever damaged.

## **AN OUNCE OF PREVENTION: START-UP GLITCHES**

**B**ecause it can take time to isolate problems caused by errors in CONFIG.SYS and AUTOEXEC.BAT, you should make backup copies of these files when your computer is running correctly. Copy the files to your emergency boot disk under names such as CONFIG.OLD and AUTOEXEC.OLD. (To maintain a historical perspective, you might work the date into each backup copy you create.) With a backup file on hand, you can quickly rename your backup version and copy it to your hard disk when calamity strikes. Of course, restoring your old start-up files doesn't solve the problem of how to fix an incorrect command, but it does let you compare the new versions of the files with the old and isolate modified lines faster.

—K.Y.N.



Before you can retrieve anything, however, you'll need an emergency boot disk to get your system running. If you haven't made one, you can start your system with the "uninstall" disk you should have created when you installed DOS 5 or 6.x.

Then after you get the machine going again, fix the error by running the ScanDisk utility (SCANDISK.EXE) supplied with DOS 6.2 and later. When you type SCANDISK at the DOS prompt, it checks your FATs, as well as your directory structure, looking for cross-linked clusters. It asks whether you want to perform a surface scan to check for physical damage.

In the absence of DOS 6.2 and later, run CHKDSK /F on a damaged disk or use a disk-repair utility such as PC Tools Pro's DiskFix module (\$179.95; Central Point Software, 800-445-4208 or 503-690-8090) or The Norton Utilities' Disk Doctor (\$179; Symantec Corp., 800-441-7234 or 408-253-9600). Third-party utilities such as these often are more useful than CHKDSK for this task, because CHKDSK looks

## AN OUNCE OF PREVENTION: HARD-DISK HANGUPS

It's worthwhile upgrading to DOS 6.2 for ScanDisk alone. Unfortunately, though, its features are poorly documented. (For an in-depth look, see "ScanDisk: An MS-DOS Self-Starter," *DRG/DOS World Special* #4, June 1994, page 36, or "ScanDisk Repairs Hard-Drive Data," July 1994, page 28.) In addition to fixing disk errors, ScanDisk can detect weak areas on your hard disk and move your data to a safer place before any damage is done. If you make a habit of running ScanDisk weekly to test your hard disk, you'll save yourself the hassle of having to deal with this type of disaster. To scan all your disks and make necessary changes, type this command:

```
SCANDISK /ALL /AUTOFIX
```

To do a surface analysis, add the switch /SURFACE. Including /NOSUMMARY tells DOS to omit the summary screen that appears after each drive is checked, which lets you run the command without user intervention.

—K.Y.N.

only for lost clusters, identifying them so that you may delete them. Disk Doctor, in contrast, tests all your partition tables, as well as the FAT and directory structure; performs a lost-cluster test; verifies compressed drives; checks a disk's boot record; and looks for physical defects on the disk's surface. In addition, it prints a report of its

findings and lets you undo any changes it makes.

A warning is in order, though: Don't run DOS-based disk-repair utilities, including SCANDISK and CHKDSK /F, from within Windows. If you do, you may lose important data. Fortunately, Windows prevents you from using DOS's disk utilities under Windows, and most up-to-date third-party utilities prevent you from calling them within Windows. But play it safe by always exiting Windows before running any DOS disk-repair package.

DOS  
TIP

### EDIT SYSTEM FILES WITH CONFIDENCE

When you need to edit AUTOEXEC.BAT or CONFIG.SYS, try using Windows' system-configuration editor, SYSEDIT.EXE, even if you don't usually work in Windows. Launching SysEdit brings to the screen four system files—AUTOEXEC.BAT, CONFIG.SYS, WIN.INI, and SYSTEM.INI—each in its own ready-to-edit text window. The advantage of using SysEdit to modify these files is that it automatically creates a backup copy of the old version of the file, assigning it an SYD extension (AUTOEXEC.SYD, CONFIG.SYD, and so on).

To call SysEdit from the DOS prompt, type the following command:

```
WIN SYSTEM\SYSEDIT
```

If SysEdit is stored in your \WINDOWS\SYSTEM directory, use this command instead:

```
WIN WINDOWS\SYSTEM\SYSEDIT
```

A stand-alone version of SysEdit is displayed on screen; Windows' Program Manager appears unobtrusively in icon or minimized form.

—Lane Olinghouse

### Yesterday My Computer Ran Just Fine—Now It's So Sloooooow

Gradual or even sudden dips in performance, or the appearance of unusual messages or on-screen "garbage," are bad signs. They often mean that your system has a virus. Thank goodness today's virus-detection programs can locate and repair most damage before it destroys your system.

To prevent things from getting any worse, turn off your computer as soon as you notice something strange going on, then restart it from the write-protected emergency boot disk you had the foresight to make. Use an antivirus program to scan your hard disk for



signs of infection (see the accompanying sidebar "DOS's Antivirus Programs," page 22), then restart your computer after successfully completing a virus check and eradication routine. This ensures that viruses are cleaned from memory. But don't quit once your hard disk is working again.

Scan all the floppy disks you used recently, because they may be infected, too. If you have a backup disk or tape, it may also have the virus. Restore it to your hard disk and scan those files as well, or reformat your backup copy so that you won't be tempted to use it sometime down the line.

### Oh, No—I Can't Believe I Deleted Those Files

It's housekeeping time—you've decided to finally clean off your hard disk. Those files left from last March are surely outdated by now, so you erase everything in that subdirectory by typing `DEL *.*`. But then you realize that March was the month in which you did the spreadsheets for the income tax due in April—and now they're history. Sound familiar?

To recover from this sort of disaster, reach for `UNDELETE` as soon as you realize you've erased a file by mistake.

Typing `UNDELETE drive: /LIST`, for example, displays a list of files you can recover on the drive you specify. You may also use wildcards with `UNDELETE`. `UNDELETE *.DOC`, for instance, recovers all files with the extension `DOC` in the current directory.

If all else fails and you get a "No files found to undelete" message, try `UNDELETE /DOS`. The system asks you to supply the first character in each filename, but if you don't remember it, that's okay: Use any character that will create a filename that doesn't already exist in the current directory.

For example, to get back a file whose name DOS tells you is `?EXT.DOC`, type `$EXT.DOC`.

Whether you can retrieve all the files you need depends on which version of DOS you're running and whether you've added a deletion-protection command to your `AUTOEXEC.BAT` file. DOS 6.x's sophisticated deletion-protection system lets you choose from three recovery methods:

- **Safe:** Use the `UNDELETE` command at the DOS prompt.
- **Safer:** Add DOS's `UNDELETE /T` command to your `AUTOEXEC.BAT` file. This sets up Delete Tracker protection.
- **Safest:** Add an `UNDELETE /S` command to your `AUTOEXEC.BAT` file. This sets up DOS's Delete Sentry protection.

If you use the Delete Sentry method, you can be almost 100-percent sure you'll get back a deleted file. When you delete files, Delete Sentry moves them to a hidden directory named `C:\SENTRY`. When this directory reaches its maximum size (about 7 percent of your hard disk's capacity), it deletes the oldest files to make room for new ones. With Delete Tracker, DOS saves only the names and cluster locations of the files you delete. If Delete Tracker is on, you can almost always get files back—if you haven't saved any other files in the meantime.

DOS 5's `UNDELETE` offers two types of deletion protection: the `UNDELETE` command and its companion, `MIRROR`.

DOS 5's `UNDELETE` affords the same level of protection as DOS 6.x's. Fortifying your `AUTOEXEC.BAT` file with a `MIRROR` command lets DOS keep track of deleted files. You use switches to tell it which drives to track.

This command, for instance, stores tracking information for drives A and C on drive C:

```
MIRROR C: /TA /TC
```

If you also wanted to keep track of deleted files on drives B and D, you'd add two more switches: `/TB`

and `/TD`. Mirror's recovery capability is similar to Delete Tracker's.

Of course, overwriting a file—saving or copying a file over an existing file, or moving a file to a directory that already contains a file of that name—is a more serious situation than simply deleting it inadvertently.

But in DOS 6.0 and later, you can sometimes recover overwritten files if you've activated the Delete Sentry feature and you notice your mistake quickly enough.

Starting with DOS 6.2, this problem should arise less frequently, because DOS asks you for confirmation before using `COPY` or `MOVE` to overwrite an existing file. If you add a `/P` switch to `DEL`—as in `DEL *.DOC /P`—DOS asks you before deleting each file.

If you find yourself using the `UNDELETE` command regularly, you

## AN OUNCE OF PREVENTION: VIRUS ATTACKS

To avoid untimely infections, scan all floppy disks before you copy files from them or install programs from them. Or keep an antivirus program such as `VSAFE` running at all times. (Better yet, do both.) Before you install a new program or upgrade an old one, scan those disks, too; even shrink-wrapped software has been known to harbor trouble. Then write-protect the disks to prevent an existing virus from infecting them.

Even if you take these precautions, however, you should expect to hear alarms go off after you upgrade an application. Don't get flustered; remind yourself that during upgrades installation programs frequently modify old versions of executable files. They may also change your `CONFIG.SYS` and `AUTOEXEC.BAT`. If you've taken the appropriate precautions, you'll know that such warnings are false alarms.

—K.Y.N.



might want to add the line `DIRCMD DEL=DEL /P` to your `AUTOEXEC.BAT` file, so that you have a chance to catch your mistake before the system erases an important file.

But remember, as with ScanDisk, you can't run `UNDELETE` when you're working under Windows. Doing so

would really mess up the data on your hard disk.

### Cold Comfort

These four disasters aren't the only calamities that can take you by surprise—not by a long shot—but they're among the worst things that

can go wrong. Most of the time, though, you can repair any damage that occurs, using tools that recent versions of DOS provide.

More comforting still is the notion that you can prevent mistakes by observing good work habits and staying cool in times of trouble. ■

## DOS's ANTIVIRUS PROGRAMS

**D**OS 6.x comes with two types of virus-detection programs for DOS: `VSAFE.COM` and `MSAV.EXE`. (The Windows versions of these programs are `MWAVTSR.EXE` and `MWAV.EXE`, respectively.) You may run `VSAFE.COM` automatically at the start of every DOS session by calling it in `AUTOEXEC.BAT`, or type `VSAFE` at the DOS prompt during a particular computing session. In either situation, the program loads into memory, where it constantly checks for viruses while you work. (Of course, having `VSAFE` keep watch all the time offers you a greater margin of safety.) If you run Windows, though, be sure to call `VSAFE` before calling Windows; if you run it afterwards, you may lose data, and you won't see the messages if `VSAFE` detects a virus. Also keep in mind that to receive `VSAFE`'s messages while you're working in Windows, you must add the command `LOAD=MWAVTSR.EXE` somewhere in your `WIN.INI` file.

As with most other DOS commands, you may fine-tune `VSAFE`'s operation by adding switches when you call it. DOS's help file (type `HELP VSAFE` at the command line) provides a complete explanation of the various options. For maximum protection, use its `/7+` and `/8+` switches to turn on virus detection for the boot sectors of your floppy disks and protection for executable files. But remember that `VSAFE` looks for changes to executable files (those with a `BAT`, `COM`, `SYS`, or `EXE` extension). Changes in a program aren't always a sign that a virus is at work, though; you may frequently edit `CONFIG.SYS` and `AUTOEXEC.BAT`, and certain programs modify themselves during execution. If you have one or more executable files that modify themselves, and you don't like false alarms, omit the `/8+` switch. By default, `VSAFE` doesn't warn you when changes are made to executable files.

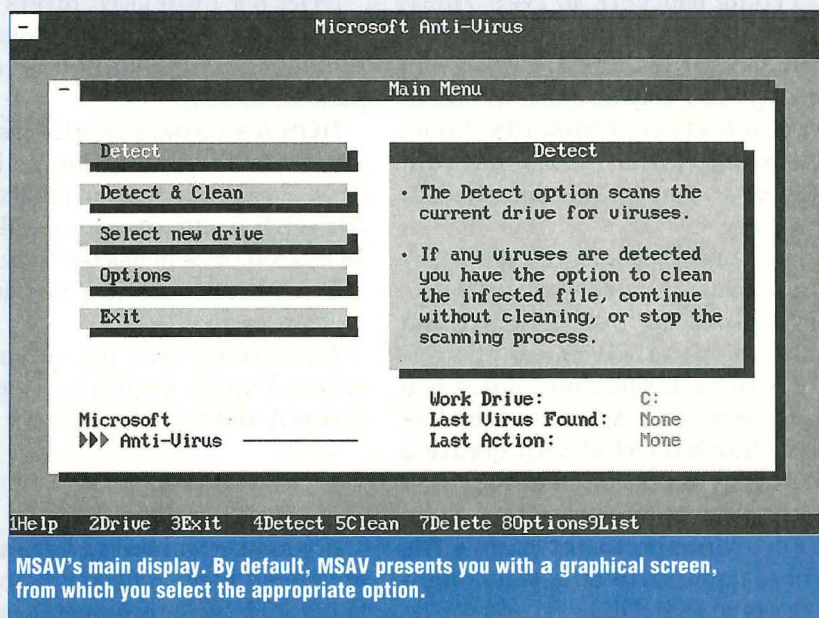
`MSAV.EXE`, the other half of DOS 6.x's antivirus team, detects known viruses and tries to eradicate them without damaging the infected file. By default, `MSAV` presents you with a mouse-driven graphical display; you click on choices to make your selections. (See the accompanying screen shot, "MSAV's main display," right.) One option you should use from time to time is Anti-Stealth. Because

`MSAV` runs more slowly when this feature is turned on, it's impractical to use it all the time.

Periodic checkups are advisable, because stealth viruses infect files without seeming to change them. A checkup is also in order if you've just received a bunch of new floppy disks from a friend of a friend or recently downloaded files from a bulletin board. To check the disk in drive A, type `MSAV A:`. To display a command-line interface instead of a graphical interface, add the `/P` switch when you call `MSAV`. Including the `/C` option tells `MSAV` to clean viruses automatically as it finds them. (If you want to make sure that a virus hasn't infected `MSAV` itself, keep a clean copy of the program on a write-protected floppy disk, and run the program from that disk.)

DOS 6.x's antivirus programs are a good first-line defense against common viruses, but more sophisticated ones are appearing all the time. You can reduce the odds of infection, however, by downloading the latest virus signatures from Central Point Software's bulletin board (503-531-8100; 8-N-1). You'd also be wise to consider a third-party program, such as Central Point AntiVirus (\$129) or Symantec's Norton AntiVirus (\$129).

—K.Y.N.





## COMPUTER CONNECTIONS

# Sharing Resources With InterLink

*It's hardly the mini-network Microsoft would have you believe, but MS-DOS 6.x's InterLink is invaluable for transferring files and sharing printers.*

by Hardin Brothers

**I**nterLink has been called a poor man's network—a program that gives users network capabilities without the bother of special cards, cables, and software. But don't get your hopes up—InterLink *isn't* a network in any real sense. It *is*, however, a potent utility that can meet the needs of many small businesses and home offices, whether for file transfer between computers or for printer sharing. All you need to get started is MS-DOS 6.x, two or more computers, and a common cable.

So what's the hitch? The difficulty with InterLink isn't the cable or the commands you use, but learning to think about it in a sensible way. In its documentation, Microsoft makes InterLink sound as complex as a network. For example, it calls one computer a *server* and the other a *client*—two network terms that make InterLink seem much more complex than it is.

Simply put, InterLink gives one computer complete access to the

disk drives and parallel printers that normally belong to a second computer. Once InterLink is running, the first computer operates as usual, but with more disk drives. The drives appear with new letters (E:, F:, and G:, for example). You can run programs and batch files, copy and delete files, use the DOS Shell or Windows, and do anything else you normally would with your computer. When you access the drives on the second computer, you may have to wait a bit longer, but otherwise you'll think your computer just grew more disk space.

Unlike a network setup, InterLink won't let you share resources such as scanners, fax/modems, and tape drives. It won't let two people work with a data file at the same time, and it will tie up one computer completely while you're using it.

On the other hand, InterLink is handy for keeping the files on your laptop and desktop computers in sync, sharing an expensive printer occasionally, and moving files from one computer to another. And, once you've set it up correctly, InterLink's commands are much easier to use than those of some networks.

## Prep Time

Before you can use InterLink, you need to select a port on each computer. You must use the same port on each machine, either the serial or the parallel; attempting to use the serial port on one and the parallel port on the other may damage either or both computers permanently. If you aren't sure which ports are free, use DOS's MSD command (Microsoft Diagnostics) on each machine. It will help you determine which ports are in use, which are free, and which aren't installed. (See "Solving IRQsome Problems," *DRG/DOS World* #17, September 1994, page 26, for more information.)

You may find that all serial or parallel ports are in use on both systems. There's nothing wrong with disconnecting a modem or a printer while you use InterLink, but remember that you won't be able to use a remote printer if you've disconnected it. If you find that you must frequently disconnect a modem or printer before using InterLink, you might want to invest in a port-switch box, which will let you toggle from InterLink to a hardware device at the twist of a dial.

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After you've selected the ports, you'll need a cable. If you use serial ports, you'll require a "null modem" serial cable with either a 25-pin or a 9-pin female connector on each end. Once you connect the two computers with a null-modem cable, each "sees"

the other as a modem because of the wiring. Null-modem cables are available in 3-wire and 7-wire (or more) configurations; use the 7-wire if possible, because it will give you access to all of InterLink's features. You'll be able to use most of the

power of InterLink even with a 3-wire cable, however.

To use parallel ports, you'll need a parallel cable with a 25-pin male connector on each end. Parallel InterLink cables are harder to find than null-modem cables; in some stores you'll see them for sale as "LapLink Parallel" cables. If you do use parallel ports and a parallel cable, you'll be able to run InterLink at its fastest possible speeds.

Actually, if you have a cable sitting around that has the correct connectors on each end, give it a try. Chances are it will work with InterLink; there are very few cables with the correct connectors that won't work.

If you want to make your own cables, DOS 6.x's on-line help includes a wiring diagram. If you have the correct connectors and cable and you're handy with a soldering iron, you should be able to make a cable in a couple of minutes.

### Division of Labor

After attaching the cables, your final preparatory task is to decide which computer will be the "server" system (also known as the *slave*) and which will be the "client" (or *master*).

*Server* and *client* are Microsoft's terms for the two computers (as noted above), suggesting that they're working as a network. Actually, though, one computer, the master, is controlling the other, the slave.

While InterLink is running, the slave is completely dedicated to its task. You can't use it for any other purpose, and if you run the server program under multitasking software like Windows, it takes over the entire computer and suspends all other programs.

The master computer, on the other hand, is more powerful than before; it can use the slave's disk drives and printer as its own. While InterLink is running, you'll probably work from the master, typing

## THE INTERSVR COMMAND

The INTERSVR command turns a computer into a "server" (or slave) and gives a "client" (or master) computer access to your disk drives and printer. While the master computer has access, you can't use the slave unless you break the link by pressing Alt+F4.

The full syntax of the INTERSVR command is as follows:

```
INTERSVR [d:[...]] [/Xd:[...]]
          [/COM[n]:address] [/LPT[n]:address]
          [/BAUD:rate] [/B] [/V] [/RCOPY]
```

If you type INTERSVR without any options, the computer will enter slave mode and scan the parallel and serial ports continuously, looking for an InterLink master. When it finds the master, it forms a link and gives the master access to all printers and drives.

You can use either of the first two options to specify the drives to which the master has access. If you simply list one or more drives (for example, INTERSVR C: D:), the master will be able to use only the drives named.

If you want to give the master access to all but one or two of the slave drives, the /X option will exclude the others. INTERSVR /XD:, for example, gives a master access to all of the slave's drives except D.

INTERSVR connects faster to the master if you tell it how the two computers are linked. INTERSVR /COM, for example, tells InterLink that the computers are connected through their serial ports.

You can specify a particular port with a command such as INTERSVR /COM1, or the hexadecimal address of the serial port with a command such as INTER-

SVR /COM:3f8. If the computers are connected through their parallel ports, you can inform InterLink with one of these commands:

- INTERSVR /LPT  
(scan all parallel ports)
- INTERSVR /LPT2  
(scan only parallel port 2)
- INTERSVR /LPT:3bc  
(use the port at address 3BC)

If you're using a serial port, you can set the baud rate InterLink will use. By default, computers using InterLink communicate at 115,200 bits per second (bps) over a serial line. With the /BAUD option, you can specify slower rates if you know your hardware can't run this fast. The valid rates are:

```
INTERSVR /BAUD:9600
INTERSVR /BAUD:19200
INTERSVR /BAUD:38400
INTERSVR /BAUD:57600
INTERSVR /BAUD:115200
```

The /B option tells INTERSVR to use a black-and-white color scheme on the slave computer. This option is most common on laptops with monochrome VGA or EGA displays.

Should either computer crash when you use InterLink to access a drive or printer, try the /V option. /V changes the way INTERSVR uses the slave's timer and may prevent those crashes.

Finally, the /RCOPY option copies both INTERSVR.EXE and INTERLNK.EXE to a remote computer. You can use it to copy the InterLink software even if you can't share disks between the two machines.

—H.B.



commands and running programs that depend on the resources of both computers.

### Setting Up the Computers

Once you connect your two machines via cable, the slave computer is especially easy to set up and use. All you have to do is type a single command: `INTERSVR`. You'll see an information display, which will stay on screen until you decide to end the InterLink utility by pressing `Alt+F4`.

While `INTERSVR` is running on the slave computer, you can't use the system for any other purpose. `INTERSVR` eliminates all multitasking, background processing, and other possible distractions. The computer devotes its entire attention to the `INTERSVR` program and the InterLink utility. When you press `Alt+F4` to end `INTERSVR`, the computer returns to normal.

Setting up the master is almost as simple. Add a line such as the following:

```
DEVICE=C:\DOS\INTERLNK.EXE
```

to your `CONFIG.SYS` file and reboot the computer to install the InterLink device driver. Then use the command `INTERLNK` from the DOS prompt to establish a connection between the master and slave. The `INTERSVR`, `DEVICE=INTERLNK.EXE`, and `INTERLNK` commands all have parameters and options you'll probably want to use. (See the accompanying sidebars, right, and on pages 24 and 26.)

Once InterLink is running and the link between the computers is established, most users find that they employ the `COPY`, `DIR`, `REPLACE`, and `DOSSHELL` commands most often. The DOS Shell (or an equivalent shell program) is especially handy if you have a lot of file maintenance to perform. You can also run Windows on the master computer and use its File Manager and other tools to move files from one computer to another.

## THE INTERLNK DEVICE DRIVER

**B**efore you can use InterLink, you must install a special device driver on the client (or master) computer, the machine that will have control once you make a connection. To do so, load `INTERLNK.EXE` with the `DEVICE=` or `DEVICE-HIGH=` statement in your `CONFIG.SYS` file and then reboot your computer.

If you use the utility more than once or twice, you might want to add an InterLink option to the multiconfiguration menus in your `CONFIG.SYS` file. You'll be able to simply reboot and select a menu choice instead of editing your `CONFIG.SYS` file each time you want to turn InterLink on or off.

The format syntax of the InterLink device driver is as follows:

```
DEVICE=[d:][path] INTERLNK.EXE
[/DRIVES:n] [/NOPRINTER]
[/COM[n]:address]]
[/LPT[n]:address]] [/BAUD:rate]
[/AUTO] [/NOSCAN] [/LOW] [/V]
```

At the very least, you must use the line `DEVICE=INTERLNK.EXE` or `DEVICE-HIGH=INTERLNK.EXE` in your `CONFIG.SYS` file.

If `INTERLNK.EXE` isn't in the root directory of your boot drive, you must specify its full path (for example, `DEVICE=C:\DOS\INTERLNK.EXE`).

Everything else on the line is optional. You can use the `/DRIVES:n` option to set the maximum number of slave drives you'll want available at one time. `INTERLNK` will create a logical drive letter for each.

If you specify zero drives with the numeral 0, `INTERLNK` will provide only printer-sharing support.

For example, if you want four InterLink drives, type this command:

```
DEVICE=INTERLNK.EXE /DRIVES:4
```

If you've set up InterLink to let the master computer use the slave's printer, you'll have to perform one additional step to send data to that

Unless the total number of drives on both computers is fewer than five, you may have to use the `LASTDRIVE` command in your `CONFIG.SYS` file to make enough drive slots available.

If you use the `/NOPRINTER` option, InterLink won't give the master access to the slave's printers. The advantage here is that `INTERLNK`'s printer-sharing code won't load, so the program will take up less room in memory.

The `/COM`, `/LPT`, `/BAUD`, and `/V` options for `INTERLNK.EXE` are the same as those for `INTERSVR`, explained in the first sidebar (page 24). If you use `/COM` or `/LPT` to tell `INTERLNK.EXE` what port you're using on the master computer, it will use less memory because it will have to load code for only one kind of port.

By default, `INTERLNK` tries to establish contact with a slave as soon as it loads. It remains in memory, however, even if that attempt fails. If you use the `/AUTO` option, `INTERLNK.EXE` will remain in memory only if it can find a slave immediately. If it can't, it will report an error and remove itself from memory.

The `/NOSCAN` option is the reverse of `/AUTO`. With this option, `INTERLNK.EXE` will load into memory without trying to connect to a slave. You can then activate InterLink anytime by running `INTERSVR` on the slave and using the `INTERLNK.EXE` command on the master.

`/LOW` tells `INTERLNK.EXE` to use only conventional memory (below 640K). By default, `INTERLNK` uses some upper memory (UMB) if any is available. You might use the `/LOW` option if you want to keep `INTERLNK` from disturbing a finely tuned set of UMB assignments or if you have reason to think your UMB or your driver is causing a problem.

—H.B.

printer from Windows. Go into the Windows Control Panel, select Printers, and then choose the appropriate printer driver. Connect



the printer to port LPT1.DOS, LPT2.DOS, or LPT3.DOS, depending on whether you've configured the master to talk to the printer as LPT1, LPT2, or LPT3.

There are some commands you should never run on an InterLink drive—commands that will cause conflicts resulting in one or both computers locking up or even loss of data on the slave computer. The forbidden commands are CHKDSK, DEFRAG, DISKCOMP, DISKCOPY, FDISK, FORMAT, MIRROR, SYS, UNDELETE, and UNFORMAT.

### Remote Connections

Perhaps only one of the computers you want to link has DOS 6.x. You could transfer the InterLink files to the other computer on disk, but only if the two machines can use the same disk size. What if your desktop computer has only a 5.25-inch drive and your laptop has only a 3.5-inch drive?

InterLink can transfer the files for you, as long as the two computers are connected with a 7-wire null-modem serial cable. You must also

be sure that the computer receiving the files has MODE.COM available, either in the default directory or via the DOS path. On the computer holding the InterLink files, type the following command:

INTERSVR /RCOPY

to start the transfer. The /RCOPY switch is an abbreviation of *remote copy*. The INTERSVR program will ask which COM port you're using on the remote computer system—that is, on the machine receiving the InterLink files. Then it will display two commands you must type on that computer.

Once you've done so, InterLink will copy both the INTERLNK and the INTERSVR programs to the second computer automatically. You can then set up InterLink following the steps above.

InterLink isn't as fancy as some of its competitors, such as LapLink from Traveling Software. Such programs often offer a simple user interface for easy file transfer, as well as a batch mode you can use to transfer data on a regular basis.

On the other hand, InterLink lets you make full use of the DOS Shell, which includes many of the capabilities of the third-party utilities.

Best of all, InterLink is included as part of MS-DOS 6.x—it can transfer files without touching the resources in your wallet. ■

## THE INTERLNK COMMAND

Once you've loaded the INTERLNK.EXE device driver in the master computer and gotten the INTERSVR program up and running on the slave computer, you must activate InterLink by typing the command INTERLNK at the DOS prompt.

This command is quite simple. Its formal syntax is INTERLNK or INTERLNK *masterD*:[*slaveD*].

In the first form, if you type simply INTERLNK, you'll see a status report of the InterLink system, showing you which drive letters on this computer (the master) are connected to which drives on the slave.

If you add the master and slave drive letters, you create a connection between a drive letter on the master and a drive on the slave. For example, the command INTERLNK G:=C: lets you access drive C: on the slave by calling it drive G on the master computer. (The colons in the command are optional.)

If you want to sever a connection, use the same command and omit the slave drive letter. For example, INTERLNK G:= disconnects the slave from the G: drive letter on the master computer. If you made an earlier connection, this releases it.

Of course, no connection will work until you hook up the computers with the proper cable, install the INTERLNK.EXE device driver in the CONFIG.SYS file of the master computer, and run the INTERSVR command on the slave computer.

—H.B.

DOS  
TIP

### QUICK OFF THE MARK

When you're in a hurry, the minute or so you have to wait for the DOS prompt to appear can raise your stress level. To get to the prompt as quickly as possible, try these two tricks.

First, disable extended-memory testing by adding the following line anywhere in your CONFIG.SYS file:

```
DEVICE=[drive:]\path\HIMEM.SYS /TESTMEM:OFF
```

This command tells HIMEM not to perform its diagnostic check of your system's extended memory, which saves five to 20 seconds, depending on the amount of memory in your system. In most computers, HIMEM's test is redundant, because the system's BIOS performs a memory check when you first turn on your computer.

To shave an additional two seconds from your start-up time, suppress the "Loading MS-DOS . . ." message by adding this line anywhere in your CONFIG.SYS file:

```
SWITCHES= /F
```

—Lenny Bailes



## USING THE DOS SHELL

# Streamlining Your Work Flow

*It may not get as much attention as Windows' famous interface, but the DOS Shell can help you organize your files and manage your projects more efficiently.*

by Jack Nimersheim

**O**rdinarily, you wouldn't think of MS-DOS as a graphical environment. Maybe that's due in part to all the hype surrounding Windows over the past few years. Introduced with DOS 4 and mysteriously removed from DOS 6.2 (see the accompanying sidebar, "Whither the DOS Shell?" on page 28), the DOS Shell isn't a full-blown multitasking environment like Windows—but it does offer several distinct advantages over working from the "naked" DOS system prompt.

For one thing, the DOS Shell Task Swapper (available after DOS 5) lets you switch among multiple applications without closing and reopening each one.

Second, the DOS Shell's ability to arrange files into program groups lets you organize projects so that

the files you need are easily accessible, regardless of where they reside on your hard disk.

Finally, the DOS Shell lets you associate a particular file extension with a specific program, so that with a single command you can load both a data file and the application program used to modify it.

But here's the best news of all: Unlike Windows, the DOS Shell performs acceptably on any IBM-compatible computer, including first-generation PC/XT systems, without any special hardware or memory requirements.

## Up to the Task

Task swapping emulates the way people, rather than PCs, work. For example, take a typical day at Constant Confusion Construction, or CCC Inc. CCC relies on several applications to manage its projects: Microsoft Word to prepare proposals and progress reports; Lotus 1-2-3 to maintain budgets, and a database for managing other critical information. Jim, a project manager at CCC, uses the DOS Shell Task Swapper to jump from application to application as he works.

Jim might be using one program—writing a proposal with Word, for instance—and switch immediately to Lotus 1-2-3 to check the project's estimated material costs. When he returns to Word, Jim finds his proposal draft still in memory, exactly as he left it, awaiting input of the 1-2-3 figures.

The DOS Shell doesn't activate task swapping automatically. You must do so manually, using the following commands. With a mouse:

- Point to Options in the DOS Shell menu bar.
- Click the left mouse button.
- Now point to the Enable Task Swapper option.
- Click the left mouse button.

From the keyboard:

- Press the Alt+O key combination to display the Options menu.
- Then type E to choose the Enable Task Swapper option.

Enabling the Shell's Task Swapper opens a new window, identified as the Active Task List, in the lower-right portion of your DOS Shell dis-

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play. Whenever this window is visible, the DOS Shell stands ready to load multiple programs into memory concurrently. You can see how this works by loading one of the utilities that ships with DOS.

Keep in mind that once you activate task swapping, the DOS Shell incorporates this setting into its default configuration. If you leave task swapping active when you exit the DOS Shell and return to the system prompt, the Active Task List appears automatically the next time you enter the DOS Shell.

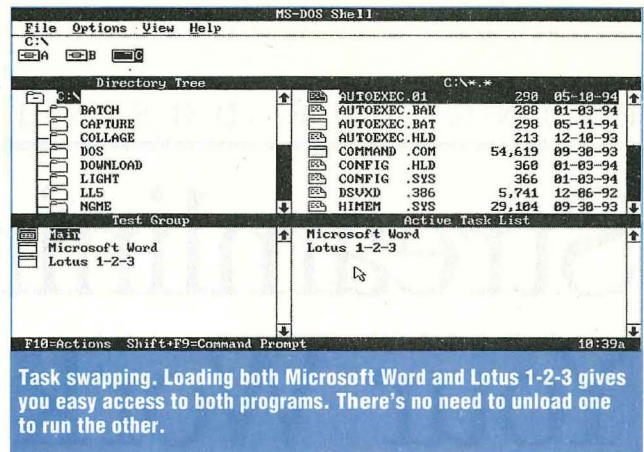
If you're using a mouse, point to Editor in the Main window of the DOS Shell display and double-click the left mouse button. If you're using the keyboard:

- Press Tab until you activate the Main program-group window.
- Use the arrow keys or type E to highlight *Editor*.
- Press Enter.

The DOS Shell displays a dialog box asking you to identify the file you want to edit. Entering the name of an existing file starts the DOS Editor and loads that file automatically into memory. If the filename you enter doesn't exist, the DOS Editor will create it.

For now, type the filename TEST-FILE.TXT and press Enter. A few seconds later the DOS Shell display is replaced with the Editor's text-editing screen.

At this point, you're ready to begin creating a file, just as you would if your started the Editor independently from the system prompt. But remember, the DOS Shell is in the background, waiting to take charge of your PC.



**Task swapping.** Loading both Microsoft Word and Lotus 1-2-3 gives you easy access to both programs. There's no need to unload one to run the other.

How can you tell? To return to the DOS Shell from a program running under task swapping, press Alt+Tab. This key combination cycles you through any programs running in a task-swapping session. Since the Editor is the only program currently open, you should return immediately to the DOS Shell. You'll notice, however, that an item marked *Editor* has been added to your Active Task List window. Pressing Alt+Tab a second time suspends the DOS Shell temporarily and returns you once again to your editing session.

There's no mouse alternative for switching back to the DOS Shell when task swapping is activated; you must use the Alt+Tab key combination. Within the DOS Shell, however, you can double-click on a task name to return to its associated application.

Although it doesn't perform true multitasking—running several programs at the same time—the DOS Shell's Task Swapper provides the next-best thing. You're running only one program at a time, but the Task Swapper remembers where you left off in each program and allows quick access, letting you accomplish more in less time.

For example, by loading Microsoft Word and Lotus 1-2-3 into the Task Swapper (see the first screen shot, "Task swapping," above), Jim can switch quickly between his draft proposal and projected budget calculations without having to

## WHITHER THE DOS SHELL?

A funny thing happened between MS-DOS 6.0 and MS-DOS 6.2: The DOS Shell disappeared. MS-DOS 6.2 requires that you order an optional \$19.95 Resource Disk to add a graphics-based interface to your DOS environment. That's the bad news. The good news is that if you're upgrading to MS-DOS 6.2 from version 5 or 6.0, Setup preserves the DOS Shell from that earlier version, provided that it's on your disk to begin with. If it isn't, you may assume that you can just reinstall MS-DOS 6.0, including the DOS Shell, and then repeat the upgrade. (Because Setup creates several special files that the DOS Shell requires to run properly, you can't simply use the EXPAND utility to transfer the DOS Shell from your 6.0 distribution disks.)

No problem, right? Wrong: big problem. If you've already run DELOLDOS after installing MS-DOS 6.2, the 6.0 Setup program no longer works. Because it can't identify MS-DOS 6.2, a later DOS version, Setup returns an "Unrecoverable Error" message and aborts the installation. If you plan on using the DOS Shell, then, make certain it's already on your hard disk before you upgrade to MS-DOS 6.2. If it isn't, you'll have no choice but to spend the extra \$20 for Microsoft's Resource Disk.

So, should you shell out the extra 20 bucks for the DOS Shell? Yes, if you want to work in a graphics-based environment and your system specs don't quite measure up to Windows' expectations. Yes, if you're not interested in using Windows-based applications but do want to take advantage of task swapping, program groups, file association, or any one of several other conveniences the DOS Shell offers the typical PC user. If any of these options interests you, the \$19.95 cost of the Resource Disk containing the DOS Shell seems a minor investment indeed.

—J.N.



unload one program completely to run the second, as he would were he not working in the DOS Shell.

### Group Therapy

A second DOS Shell feature that's not available with standard DOS is the ability to create and use program groups. Program groups are a valuable organizational tool. Think of them as an electronic file cabinet. Just as a file cabinet can contain more than one drawer, a program group can contain multiple programs or even additional groups (unlike Windows' program groups).

Like most businesses, CCC survives by having several projects in the works at any given time. The ability to create program groups within the DOS Shell lets CCC gather together all work relating to a given project and ensures easy accessibility from the DOS Shell.

To create program groups, use the New command. This option appears automatically in the DOS Shell File menu whenever you're working within the program-group window. To create a new program group:

- Select File from the DOS Shell menu bar.
- Select the New option.
- Select Program Group from the New Program Object dialog box.
- Click on OK or press Enter.

This sequence displays the Add Group dialog box. You must enter a

program-group name in the Title field. Be as descriptive as you like. Group names aren't limited to the eight characters mandated by DOS; they can be up to 74 characters long. Jim used the group name "City Park Project" to represent one of his pending proposals. The DOS Shell responded by adding a new group called *City Park Project* to the DOS Shell display. (See the second screen shot, "Adding a program group," below left.) Using the same technique, CCC could create separate program groups for every current or pending project.

Creating a program group is only half the job. It's like assembling a new file cabinet—you still have to decide what you want to store in this cabinet before it can be a truly efficient organizational tool. To do that in the DOS Shell, just add items to your program group.

If Jim were adding items to his City Park Project group, he'd follow these steps:

- Use the mouse or arrow keys to highlight *City Park Project*.
- Double-click the mouse or press Enter to activate the group.
- Select File from the DOS Shell menu bar.
- Select the New option.
- Select Program Item from the New Program Object dialog box.
- Click on OK or press Enter.

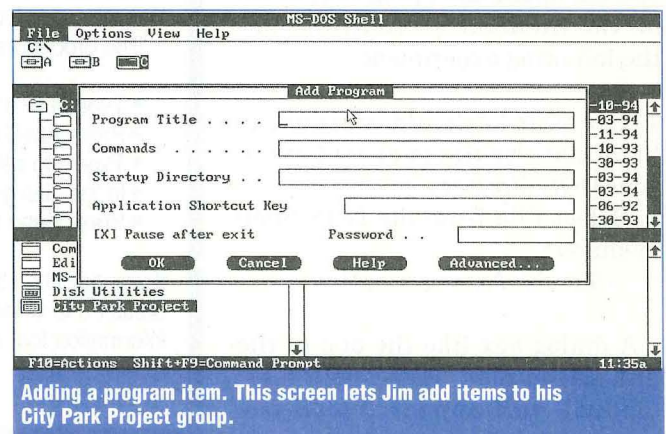
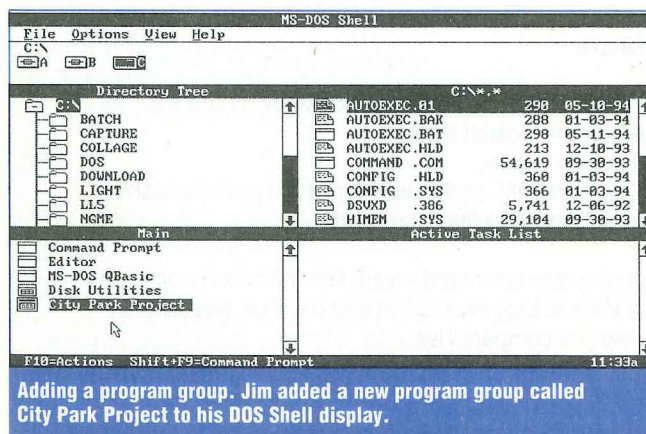
This sequence displays the Add Program dialog box shown in the

third screen shot, "Adding a program item" (below right). You use the Add Program dialog box to tell the DOS Shell how you want it to perform the task associated with the item you're creating. Information entered here includes the following:

- **Program Title:** the name you want to appear in the program-group window for this item
- **Commands:** the exact command or commands used to initiate the task associated with this item
- **Startup Directory:** the directory you want to activate whenever this item is selected
- **Application Shortcut Key:** an optional key combination you can use to switch immediately to this item if it's running in the Active Task List
- **Pause after exit:** if checked, instructs DOS to pause after completing this task and wait for a keypress before returning to the DOS Shell display
- **Password:** an optional field for restricting access to this item

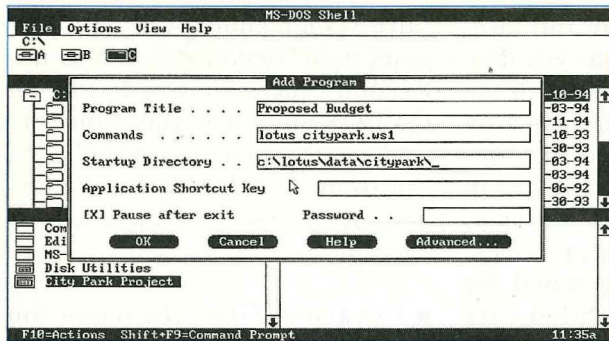
The fourth screen shot, "Loading a spreadsheet file" (page 30, top), shows how CCC would run Lotus 1-2-3 and load automatically into memory a spreadsheet file containing the proposed budget figures for the City Park Project outlined above.

One important thing to remember about program groups is that the individual items they contain may

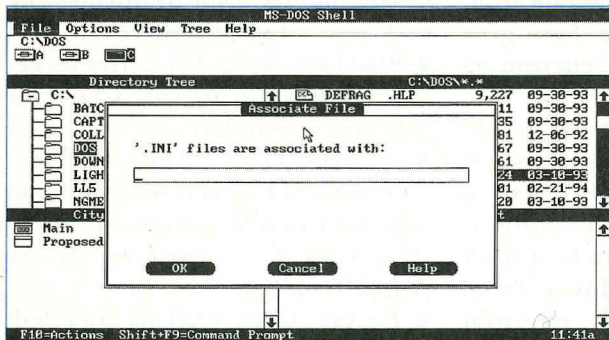




## USING THE DOS SHELL



Loading a spreadsheet file. These commands will launch Lotus 1-2-3 as well as load a spreadsheet for Jim's City Park Project.



Associating files. Fill in this dialog box to specify an application you want to run when you select files with the INI extension.

be spread hither and yon across your disk. This ability to gather together related programs and data files, regardless of where they're stored physically on a disk, lets you organize the various elements associated with a particular project without wreaking havoc within your carefully designed directory structure.

### Close Ties

Finally, one simple but potentially time-saving DOS Shell device lets you associate a group of files with a specific application program, based on the filename's extension. Try the following experiment:

1. Use your keyboard or mouse to highlight the file DOSSHELL.INI in your DOS directory.
2. Select File from the DOS Shell menu bar.
3. Select the Associate option.

A dialog box like the one in the fifth screen shot, "Associating files" (above), will appear. You'll use

it to specify an application you want to run whenever you select any files with the same extension as the current file—INI (initialization) files, in this example. For instance, you may want to set up a situation where you can use EDIT.COM, the DOS text editor, to modify the contents of your INI files. To create this association:

- Type EDIT.COM in the text field of the Associate File dialog box.
- Click on OK or press Enter.

To see what you've accomplished, double-click on DOSSHELL.INI, or, using the keyboard, highlight DOSSHELL.INI and press Enter. Because of the association you created, this runs EDIT.COM and loads the DOSSHELL.INI

file automatically into memory for editing. (Before this association existed, DOS would have beeped, indicating that the file you selected wasn't an executable program.) Once you establish an association, DOS applies it to all files with the same extension. In other words, clicking on any INI file would now run EDIT.COM and load the specified file into memory for editing.

Associations are very convenient. Suppose that CCC decided to name all budget spreadsheets associated with any of the company's projects with the file extension BGT. Associating BGT files with Lotus 1-2-3 would let an employee start Lotus and immediately begin editing the desired budget figures by clicking on the appropriate filename within a directory listing in the DOS Shell display.

Admittedly, the DOS Shell isn't Windows. Still, it provides capabilities and conveniences that simply aren't available when you're working directly from the DOS system prompt. Let's face it—not everyone needs Windows. But almost every DOS user can benefit from using the DOS Shell to organize his or her work. ■

DOS  
TIP

## HELP IS AT HAND

If you need help with a DOS command, but don't know which command is appropriate, don't despair. DOS 6.0 and later let you search through help files for information on a specific topic. For example, suppose you want to compare the contents of two disks, but don't know which DOS command handles that task. You can find out by searching DOS's help files for the word *compare*.

The procedure is simple:

- Type HELP at the DOS prompt to display the command reference.
- Press Alt+S to display the Search menu.
- Type F to select the Find option.
- In the dialog box, type COMPARE as the word for which you're searching.
- Press Enter to accept OK and initiate the search.

If you don't find the appropriate command on the first "hit," don't worry; just press F3 to select the Repeat Last Find option and continue scanning for information that will help you compare files.

—Jack Nimersheim



## P C T O O L B O X

# Put Your Text On the Move

*Text motion may be all downhill under DOS, but here's a slick utility that will shift your batch files into reverse gear.*

by Robert L. Hummel

**P**rogress in the personal-computer industry comes in fits and starts. It wasn't too long ago that I considered the "Press 1 to open a document" type of menu to be state-of-the-art. Now even the simplest notepad editor features drop-down menus and on-line help. I'll just bet that the phrase uttered most often by software designers is "Why didn't I think of that sooner?"

The way we view information has also changed drastically. We used to move through data page by page, like reading an electronic book. You could see one page or the next, but never part of both at the same time.

Modern software, thank goodness, now emphasizes easy movement; you can go forward or backward at will, heedless of arbitrary

boundaries, working in a natural and productive fashion.

All is not roses, however, in the contemporary software garden. As you might expect, DOS is the one major program that has stubbornly resisted the pressure to improve its interface.

DOS has never grown past its archaic approach to information presentation. It writes data to your screen according to one simple rule: Start at the top and move ever downward. When the screen is full, DOS scrolls the data up one line and writes the new data at the bottom.

That's not too bad if you're just using DOS to run your applications. But if you like to create your own batch programs, DOS's poor screen management can limit your creativity. What's missing, and consequently unavailable to DOS's batch programming language, are basic tools for scrolling the screen.

In this column, I'll present Scroll, a new utility you can use to scroll the screen up or down at will. You don't have to scroll the entire screen, and you can specify any

rectangular portion of the display—all of it, or even just a single character. Using Scroll, you'll finally break DOS's fixation with one-way screen movement.

## Down for the Count

You've seen DOS scroll the screen so often, you automatically take special steps to keep long directories or files from scrolling out of sight before you've had the chance to read them. (If the difference between scrolling the screen and scrolling text seems a little murky, see the accompanying sidebar, "Down to the Top," page 32.)

Internally, DOS keeps track of the line on which it's currently writing text. DOS doesn't do anything with this information until it detects that moving to the next line will put it below the bottom of your display.

DOS then copies lines 2 through 25 on the display to lines 1 through 24; the text on line 1 is overwritten and lost forever.

Finally, it erases the bottom line of the display and resumes its original job of writing text.

*Contributing Editor Robert L. Hummel is the author of PC Magazine's Programmer's Technical Reference: The Processor and Coprocessor and PC Magazine Assembly Language Lab Notes (both from Ziff-Davis Press).*



DOS's control of screen scrolling is simplistic: It moves inexorably downward and always scrolls the entire screen. Your batch files inherit this limitation: You simply write your text to the screen, letting DOS handle the scrolling. Or you can display entire screens of text, clearing the screen between them. This latter method looks better, but works only if your information partitions naturally into entire screenfuls.

Typically, when a batch program can't do what you need, your only option has been to learn a programming language, such as Basic or Pascal. But even these languages don't always provide functions for complete control of screen

scrolling. The time has come to beat those programming languages to the punch.

### Ups and Downs

Before you can use Scroll, you'll have to create it. To convert the SCROLL.SCR Debug script shown in the first listing (facing page, top) to the executable program SCROLL.COM, follow the instructions outlined in the "Debug Scripts" section of "How to Use This Magazine" (page 76 in this issue).

With Scroll, you can define any rectangular area of the screen as a window and then scroll the text in that window up or down. To define a window and scroll its contents, simply use the following command:

```
SCROLL row col nrow ncol [+|-]n
```

Here, *row* represents the number of the uppermost row of the window. The top row on your display is always row 1; row numbers increase as you move down the screen. On DOS's default 80-by-25 text display, the bottom row will be row 25. If you've set your screen to use 43 or 50 rows, however, Scroll can also accept row values up to those limits.

Similarly, *col* represents the leftmost column of the window. The first column on your display is column 1; on a typical screen, the rightmost column is column 80. The two arguments *nrow* and *ncol* specify the number of rows and columns in the window, respectively.

The  $[+|-]n$  parameter specifies the number of rows within the window you want to scroll and which way: You must include the plus or minus character to indicate the scroll direction. Specify  $+n$  and Scroll will move the text in the window up, adding blank lines at the bottom as required. To move text down in the window, adding blank lines at the top, specify  $-n$ . Specifying a value of 0 (zero) for *n* clears the entire window, regardless of its size.

Scroll is small; as a result, it doesn't contain any extra instructions to check for errors in input arguments. If you pass too few arguments, or arguments with nonsensical values, the results will be unpredictable. You can't damage your computer or display, though, so don't be afraid to experiment. If you wind up with a strange-looking screen, simply execute the CLS command.

You can use the Scroll utility as the core around which to build a scrolling menu. The UPDOWN.BAT program presented here (facing page, middle) implements a simple menu that can serve as a template for your own programs. Using the program SAYAT.COM (presented originally in DRG/DOS World #17, September 1994, page 32, and

## DOWN TO THE TOP

There's an undeclared war of sorts raging in the computer industry. On one side are those who speak in terms of scrolling text, and they've squared off firmly against those who speak of scrolling viewports. No shots have been fired, but there have been several heated exchanges.

The problem is one of viewpoint. Picture in your mind a long roll of paper covered with pages of text. Place that paper behind a piece of cardboard containing a small cutout, so that only page 3 of the text is visible. Press the Page Down button and ask yourself, "What page of the text is now visible?"

If you think you'd be looking at page 2, you subscribe to the text view of scrolling. In this case, you consider the viewport fixed and the text moveable. To you, *Page Down* means to literally move the page down.

On the other hand, if you think you'd be seeing page 4, you belong to the viewport group. In this model, the text is fixed and the cursor controls move the viewing window. In your case, *Page Down* means to move down the page.

With few exceptions, the viewport group is dominant among designers of application programs. Nonetheless, semantic problems still occur. The ultimate authority, and the one to which we'll defer, is the collection of BIOS functions that perform the work of scrolling:

- **Scroll up.** Move the text on screen up; the action performed by the Page Down key or the down-arrow cursor key.
- **Scroll down.** Move the text on screen down; the action performed by the Page Up key or the up-arrow cursor key.
- **Scroll right.** Move the text on screen left; the action performed by the right-arrow cursor key.
- **Scroll left.** Move the text on screen right; the action performed by the left-arrow cursor key.

—R.L.H.



**SCROLL.SCR** creates the program **SCROLL.COM**, which paints windows on your PC's display.

N SCROLL.COM	MOV AH,8	MOV BL,6	CMP AL,20
A 100	INT 10	CMP AL,2D	JZ 171
MOV AH,F	MOV BP,AX	JNZ 14A	SUB AL,30
INT 10	MOV AH,2	INC BL	AAD
MOV AH,3	POP DX	CALL 156	MOV AH,AL
INT 10	INT 10	MOV AL,AH	JMP 164
PUSH DX	CALL 156	MOV AH,BL	POP SI
MOV SI,81	DEC AH	MOV BX,BP	RET
CALL 156	MOV DH,AH	INT 10	
DEC AH	ADD DH,CH	RET	R CX
MOV CH,AH	CALL 156	MOV AX,2901	73
CALL 156	DEC AH	MOV DI,5C	W
DEC AH	MOV DL,AH	INT 21	Q
MOV CL,AH	ADD DL,CL	PUSH SI	
MOV AH,2	LODSB	MOV SI,5D	
MOV DX,CX	CMP AL,20	SUB AX,AX	
INT 10	JZ 13D	LODSB	

End

**UPDOWN.BAT** demonstrates how to call the Scroll utility within a batch program to move text in a window up and down on demand.

@ECHO OFF	SAYAT 20 1 "Press U to scroll up,	:DOWN
REM - Scroll a menu up or down	D to scroll down,	
REM - inside a screen window	X to exit "	IF %TOP%==1 GOTO LOOP
	CHOICE /CUDX /N :	SCROLL 8 35 5 10 -1
SET D1="Monday "	IF ERRORLEVEL 3 GOTO EXIT	IF %TOP%==2 SET TOP=1
SET D2="Tuesday "	IF ERRORLEVEL 2 GOTO DOWN	IF %TOP%==1 SAYAT 8 35 %D1%
SET D3="Wednesday "		IF %TOP%==3 SET TOP=2
SET D4="Thursday "	REM Scroll the menu up	IF %TOP%==2 SAYAT 8 35 %D2%
SET D5="Friday "	REM Write new line at bottom	GOTO LOOP
SET D6="Saturday "		:EXIT
SET D7="Sunday "	IF %TOP%==3 GOTO LOOP	SET D1=
SET TOP=1	SCROLL 8 35 5 10 +1	SET D2=
CLS	IF %TOP%==2 SET TOP=3	SET D3=
SAYAT 8 35 %D1%	IF %TOP%==3 SAYAT 12 35 %D7%	SET D4=
SAYAT 9 35 %D2%		SET D5=
SAYAT 10 35 %D3%	IF %TOP%==1 SET TOP=2	SET D6=
SAYAT 11 35 %D4%	IF %TOP%==2 SAYAT 12 35 %D6%	SET D7=
SAYAT 12 35 %D5%	GOTO LOOP	SET TOP=
:LOOP	REM - Scroll the menu down	

End

Use **SAYAT.SCR** to create **SAYAT.COM**. **SAYAT.COM** positions the cursor and then displays a line of text.

N SAYAT.COM	DEC DI	MOV DH,AH	INT 10
A 100	MOV AH,F	SUB AX,AX	MOV AH,40
MOV CL,80	INT 10	MOV SI,6D	MOV BX,1
DEC CL	PUSH BX	LODSB	MOV DX,BP
SUB CH,CH	SUB AX,AX	CMP AL,20	MOV CX,DI
MOV AL,22	MOV SI,5D	JZ 143	SUB CX,DX
MOV DI,81	LODSB	SUB AL,30	INT 21
REPZ	CMP AL,20	AAD	RET
SCASB	JZ 12D	MOV AH,AL	
JNZ 159	SUB AL,30	JMP 136	R CX
MOV BP,DI	AAD	DEC AH	5A
REPZ	MOV AH,AL	MOV DL,AH	W
SCASB	JMP 120	MOV AH,2	Q
JNZ 159	DEC AH	POP BX	

End



shown here on page 33, bottom), UpDown creates a five-line window in the center of your display and fills it with the first five of seven menu choices. Here, I've chosen the first five days of the week.

To grab user responses, I've included CHOICE. Because this example is just a demonstration, I'm offering only three options: scroll the menu up, scroll the menu down, or exit the program. Based on your input, the UpDown program performs the appropriate task. It automatically keeps track of which lines your system is displaying and so prevents you from scrolling past the beginning or end of the menu choices. You can expand on these ideas to accommodate more choices and to do something unique for each menu selection.

### Special Effects

Scroll isn't only for serious work; it also gives you a chance to add visual effects to your batch programs. CLS

**VERTWIPE.BAT** clears your screen by wiping text from the top and bottom simultaneously.

```
@ECHO OFF
REM - Clear the screen
REM - by scrolling
REM - the top and bottom
REM - together
```

```
SET R=
```

```
:LOOP
SET R=X%R%
IF %R%==XXXXXXXXXXXXX GOTO EXIT
```

```
SCROLL 1 1 13 80 -1
SCROLL 13 25 13 80 +1
GOTO LOOP
```

```
:EXIT
SET R=
CLS
```

*End*

is useful, but boring. VERTWIPE.BAT, shown in the fourth listing (above), on the other hand, makes clearing your screen an adventure.

VertWipe splits your screen horizontally into two windows. The top window contains rows 1 through 13; the bottom window contains rows 13 through 25. VertWipe alternately scrolls the text in the top window down and the text in the bottom window up one line at a time. Both halves seem to fold up into a single line, then disappear.

Another variation on screen clearing is STRIPES.BAT, shown in the fifth listing (below left). This program divides the screen into eight vertical bars, each ten columns wide and 25 rows long. Adjacent bars then scroll in opposite directions, like a curtain opening.

My final replacement for CLS is CHECKER.BAT, shown in the sixth listing (below middle). The screen is divided into three rows and four columns, for a total of 12 squares. The text in the squares doesn't scroll;

**STRIPES.BAT** scrolls vertical bars in opposite directions to create the effect of a curtain opening.

```
@ECHO OFF
REM Wipe the screen by scrolling
REM 8 bars in different
REM directions
```

```
SET R=
```

```
:LOOP
SET R=X%R%
IF %R%==XXXXXXXXXXXXXXXXXXXXXXXXX
GOTO EXIT
```

```
SCROLL 1 1 25 10 +1
SCROLL 1 11 25 10 -1
SCROLL 1 21 25 10 +1
SCROLL 1 31 25 10 -1
SCROLL 1 41 25 10 +1
SCROLL 1 51 25 10 -1
SCROLL 1 61 25 10 +1
SCROLL 1 71 25 10 -1
GOTO LOOP
```

```
:EXIT
SET R=
CLS
```

*End*

**CHECKER.BAT** divides the screen into 12 squares and clears them one at a time.

```
@ECHO OFF
REM Clears your screen
REM in 12 squares -
REM checkerboard fashion
```

```
SCROLL 01 01 08 20 0
SCROLL 01 41 08 20 0
SCROLL 09 21 09 20 0
SCROLL 09 61 09 20 0
SCROLL 18 01 08 20 0
SCROLL 18 41 08 20 0
SCROLL 01 21 08 20 0
SCROLL 01 61 08 20 0
SCROLL 09 01 09 20 0
SCROLL 09 41 09 20 0
SCROLL 18 21 08 20 0
SCROLL 18 61 08 20 0
```

*End*

**GOTOROW.SCR** creates GOTOROW.COM, which lets you place the cursor in any row on screen.

```
N GOTOROW.COM
A 100
MOV AH,F
INT 10
PUSH BX
SUB AX,AX
MOV SI,5D
LODSB
CMP AL,20
JZ 117
SUB AL,30
AAD
MOV AH,AL
JMP 10A
DEC AH
MOV DH,AH
SUB DL,DL
MOV AH,2
POP BX
INT 10
RET
```

```
R CX
23
W
Q
```

*End*



instead, each square clears individually with a single command by specifying 0 (zero) for the *n* argument.

### Sizzle Sells the Steak

These sample batch programs should start you thinking of ways you can dress up your own batch programs with scrolling and atten-

tion-getting screen wipes. Combine Scroll with utilities presented originally in previous issues of *DOS World*. Good candidates are GOTO-ROW.COM (*DOS World* #17, September 1994, page 31, shown here on the facing page, bottom right), which positions your cursor to any row on screen, and SAYAT.COM, men-

tioned above, which positions the cursor and then displays a line of text. Also try WINAT.COM (*DOS World* #18, November 1994, page 30, shown here below) to draw color windows, and BOXAT.COM (*DOS World* #18, page 32, shown here at bottom) to surround them with various border styles. ■

**WINAT.SCR creates the program WINAT.COM, which creates color windows on screen.**

N WINAT.COM	ADD DH,CH	OR BH,AH	JZ 156
A 100	CALL 13B	MOV AX,600	SUB AL,30
MOV SI,81	DEC AH	INT 10	AAD
CALL 13B	MOV DL,AH	RET	MOV AH,AL
DEC AH	ADD DL,CL	MOV AX,2901	JMP 149
MOV CH,AH	CALL 13B	MOV DI,5C	POP SI
CALL 13B	MOV BH,AH	INT 21	RET
DEC AH	CALL 13B	PUSH SI	
MOV CL,AH	SHL AH,1	MOV SI,5D	R CX
CALL 13B	SHL AH,1	SUB AX,AX	58
DEC AH	SHL AH,1	LDSB	W
MOV DH,AH	SHL AH,1	CMP AL,20	Q

End

**BOXAT.SCR creates the program BOXAT.COM, which uses any of several styles of graphics characters to add borders to on-screen windows.**

N BOXAT.COM	CALL 1AA	MOV AH,2	MOV AH,2
A 100	MOV AH,2	MOV DX,[106]	ADD DL,[105]
JMP 133	MOV DX,[106]	INT 10	DEC DL
DB 00,00,00,00,00,00,00	INT 10	RET	INT 10
DB DA,C4,BF,B3,C0,C4,D9	MOV AX,2901	MOV AH,A	MOV AH,A
DB C9,CD,BB,BA,C8,CD,BC	MOV DI,5C	MOV CX,1	MOV CX,1
DB DB,DB,DB,DB,DB,DB,DB	INT 21	INT 10	INT 10
DB B2,B2,B2,B2,B2,B2,B2	PUSH SI	POP CX	POP CX
DB B1,B1,B1,B1,B1,B1,B1	MOV SI,5D	LOOP 1BE	LOOP 1BE
DB B0,B0,B0,B0,B0,B0,B0	SUB AX,AX	MOV DX,BP	MOV DX,BP
MOV SI,81	LDSB	INC DH	INC DH
CALL 18D	CMP AL,20	MOV AH,2	MOV AH,2
DEC AH	JZ 1A8	INT 10	INT 10
MOV [102],AH	SUB AL,30	LDSB	LDSB
CALL 18D	AAD	MOV AH,E	MOV AH,E
DEC AH	MOV AH,AL	INT 10	INT 10
MOV [103],AH	JMP 19B	LDSB	LDSB
CALL 18D	POP SI	MOV AH,A	MOV AH,A
CALL 18D	RET	SUB CH,CH	SUB CH,CH
MOV [105],AH	MOV BP,DX	MOV CL,[105]	MOV CL,[105]
MOV AH,F	MOV BH,[108]	DEC CX	DEC CX
INT 10	CALL 1E8	ADD DX,CX	ADD DX,CX
MOV [108],BH	LDSB	DEC CX	DEC CX
MOV AH,3	SUB CH,CH	INT 10	INT 10
INT 10	MOV CL,[104]	MOV AH,2	MOV AH,2
MOV [106],DX	DEC CL	INT 10	INT 10
CALL 18D	DEC CL	LDSB	LDSB
DEC AH	PUSH CX	MOV AH,A	MOV AH,A
CMP AH,5	MOV DX,BP	MOV CX,1	MOV CX,1
JA 18C	INC DH	INT 10	INT 10
MOV AL,7	MOV BP,DX	RET	RET
MUL AH	MOV AH,2		
MOV SI,109	INT 10	R CX	R CX
ADD SI,AX	MOV AH,A	10D	10D
MOV DH,[102]	MOV CX,1	W	W
MOV DL,[103]	INT 10	Q	Q

End



## B A T C H - F I L E M E D I C

# A Batch-File Breakthrough

*Who says you can't teach an old DOS new tricks? Here's a new way to use batch files to break text into two parts.*

by Hardin Brothers

*Original batch files are hard to come by these days. Computer users have discovered, explored, and exploited nearly every trick the batch language will allow. Programmers root out new techniques about as often as mathematicians announce new prime numbers, and even then they're usually variations on familiar themes.*

*So when DOS World's technical editor and columnist Hardin Brothers wrote us that he was "really excited" about an "obscure, undocumented feature" he had unearthed, we weren't exactly prepared to stop the presses—that is, until we took a close look at his discovery. Hardin's come up with a terrific trick, one that will let you write batch files that heretofore haven't been possible without the help of a higher-level language such as QBasic.*

*In brief, Hardin's technique lets you parse strings; you can now break a filename into its base name and extension. Once you've broken a filename into its two components,*

*your batch files can handle all sorts of file-management chores.*

*The process involves using the slash character in the set of a FOR-IN-DO command. The slash acts as an escape code, which breaks a subsequent string into two parts. Because Hardin's procedure is involved—incorporating a couple of FOR-IN-DOs, a loop, and several environment variables—we're spreading this column across two issues. This month, Hardin will describe his technique and give you a few simple examples to show you how it works. In our next issue, he'll dive into some more complex uses.*

—Eds.

**T**he FOR-IN-DO command includes a little-known use for the forward slash (/) that gives batch files an entirely new dimension. Using my technique, you can break a filename into its base and extension, add or remove a trailing backslash from a pathname, and even add and subtract numbers.

To demonstrate this feature, I'll show you a couple of simple batch files that will help you understand

the concept. In the next issue (*DOS World* #20, March 1995), I'll show you how to use the technique to write a batch file that deletes backup files for which an original file exists. For example, if the batch file finds a file named TEST.BAK, it will delete the file only if the directory contains another file named TEST.TXT, TEST.WP, or TEST.DOC.

## Slash and Burn

DOS interprets a slash within the (set) portion of a FOR-IN-DO command as an escape character. It doesn't interpret the slash literally, but as a command: FOR-IN-DO discards the slash and reads the next character as a single-byte parameter.

If you display the variable that follows FOR, you'll see that the slash command or escape character breaks a word into two pieces. For example, this command:

```
FOR %%C IN (/WHEEL) DO ECHO %%C
```

displays the following lines:

```
W
HEEL
```

*Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years.*



**VERT.BAT** uses DOS's **FOR-IN-DO** command and the forward slash to break strings into characters and display the contents of the command line vertically. To create the omega in DOS's **EDIT.COM** text editor, hold down the **Alt** key and type its ASCII code, 234, on the numeric keypad (Num Lock on). When you release the **Alt** key, the omega will appear on screen.

```
@ECHO OFF
CLS
SET CMD=%1Ω
:LP
SET ORIG=%CMD%
IF "%CMD%"=="Ω" GOTO DONE
FOR %%A IN (/CMD%) DO SET CMD=%%A
FOR %%A IN (/ORIG%) DO IF %%A%CMD%==%ORIG% ECHO %%A
GOTO LP
:DONE
SET CMD=
SET ORIG=
```

End

**FOR-IN-DO** sees the contents of the set as **/w** and **HEEL**. To interpret the **/w**, **FOR-IN-DO** discards the slash and accepts the **w** as the first character. The slash lets **FOR-IN-DO** work with strings within quotation marks, with commas (which normally separate items in the set), and with other unusual characters. But it also turns out to be much more than that: It's the batch language's only method of breaking a string into individual characters.

To see the slash in action, let's start with a simple task: displaying the command line vertically. If we start this batch file, **VERT.BAT** (see the listing above), like this:

```
VERT DOSWORLD
```

it will display this:

```
D
O
S
W
O
R
L
D
```

The third line sets the environment variable **CMD** to the contents

of variable **%1**, which in this case is **DOSWORLD**. The same line adds a nonsense character at the end to serve as an end-of-string character; DOS uses it to tell the batch file when to stop extracting characters. I've used ASCII character 234 (Ω, the Greek letter *omega*); you can use any character not included in

the word you're printing vertically. (See the caption accompanying the **VERT.BAT** listing for instructions on entering special characters.)

The real work starts in the fifth line, inside the loop labeled **LP**. First, the program stores a copy of **CMD** in a variable called **ORIG**. Then it tests to see whether it has printed all the original characters. (As you'll see, **CMD** loses one character each time the program executes a loop.) If not, the seventh and eighth lines get the next letter and print it. These are the lines that deserve careful study.

If we weren't using the slash before the variable **CMD** in the set, the seventh line would simply see a single item: **DOSWORLD**. It would put **DOSWORLD** into the variable **%%A** and then set **CMD** to **DOSWORLD**. Remember, however, that the slash splits the item in two.

Thus, **FOR-IN-DO** in the seventh line executes twice. The first time, **%%A** contains the first letter, **D**, and sets **CMD** to **D**. The second time, **%%A**

**EXTRACT.BAT** uses the **FOR-IN-DO** slash to separate a filename's base name and extension. You can apply this batch-file tool in any number of ways, including automatic comparison and deletion of multiple file copies. (Look for detailed instructions and sample programs in the next issue of *DOS World*.)

```
@ECHO OFF
SET NAME=%1
IF "%NAME%"==" " GOTO DONE
SET TNAME=%NAME%Ω
SET BASE=
SET CHAR=
:LP
SET TEMP=%TNAME%
IF "TNAME%"=="Ω" GOTO DONE
FOR %%A IN (/TNAME%) DO SET TNAME=%%A
FOR %%A IN (/TEMP%) DO IF %%A%TNAME%==%TEMP% SET CHAR=%%A
IF "%CHAR%"=="." GOTO DONE
SET BASE=%BASE%%CHAR%
GOTO LP
:DONE
ECHO Original filename: %NAME%
ECHO Base of filename: %BASE%
SET CHAR=
SET TEMP=
SET TNAME=
```

End



contains the rest of the string, OSWORLD, and sets CMD to OSWORLD.

The program continues to the eighth line. Again, FOR-IN-DO executes twice. The first time, %%A contains the first letter, D. Then it uses an IF statement to compare this letter combined with the contents of CMD to the string with which the loop started. In other words, the IF statement's logic looks like this to DOS:

```
IF D+OSWORLD = DOSWORLD,
    then display D
```

Since the two strings match, the program echoes D. The second time, %%A contains the rest of ORIG, OSWORLD. The IF statement's logic looks like this:

```
IF OSWORLD+OSWORLD=DOSWORLD,
    then display OSWORLD
```

Since the two strings don't match, the program displays nothing further and jumps back to the beginning of the loop. On the second pass, CMD now contains OSWORLD, which it stores in ORIG. The routine executes again, this time using OSWORLD as the string, and the eighth line eventually displays the character O. The LP loop executes as many times as there are characters in the string until nothing but the end-of-string marker is left, when the program returns to the DOS prompt.

Study the fourth through ninth lines carefully. Once you understand them, your batch files can break any word into two pieces. And when they can do that, they'll be able to perform stunts that most batch files can't even dream about. This month's main demonstration program will use these six lines, with some minor modifications, to

break a filename into its base and extension.

### Extracting Base Names

A DOS filename is made up of a PATH (drive and directories), a base name of up to eight characters, and an optional period and extension of up to three characters. The most difficult part of our backup-deletion program (which will appear in the next issue of *DOS World*) is removing the extension from a filename, which is where we'll apply the FOR-IN-DO slash.

We can already break a string into two parts: the first character and everything else. The outline for pulling the base name from a full filename goes like this:

1. Remove one letter from the beginning of the full filename.
2. If that letter is a period or the special end-of-string mark, end.
3. Otherwise, put the letter at the end of the base-name string and go back to step 1.

The batch-file fragment is shown in the accompanying listing EXTRACT.BAT (page 37, bottom). To see it work, use it the same way you do VERT.BAT. If you type this line:

```
EXTRACT SAMPLE.TXT
```

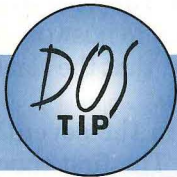
your screen will display the following information:

```
Original filename: SAMPLE.TXT
Base of filename: SAMPLE
```

### Next Month

The two files presented this month should show you how the FOR-IN-DO slash works and suggest some ways you can put it to work in batch programs.

Stay tuned: In the next installment of "Batch-File Medic," you'll build on EXTRACT.BAT to create a backup-deletion program. Until then, try to come up with a few unique applications of your own for this handy technique. ■



## IS YOUR SERIAL PORT UP TO SPEED?

If you've recently purchased a high-speed modem that transmits data at 14,400 bps or faster, you may have noticed that your uploads and downloads are plagued with error messages such as "Data overrun," "Bad CRC," and "Serial input error." The most common cause of these messages is an older serial port that isn't equipped with a modern, high-speed UART (universal asynchronous receiver/transmitter) chip. To eliminate problems of this type when transmitting data at speeds above 9600 bps, you need a serial port with a 16550AF chip.

To see whether your serial card is equipped for high-speed modems, you can run DOS's diagnostic program, MSD.EXE, available in MS-DOS 6.0 and later and Windows 3.1 and later. (Normally, it resides in your \DOS or \WINDOWS directory. If you try to run MSD.EXE within Windows, the system warns you that you might receive inaccurate information. Because you merely want to find out which chip your serial port has, ignore this message and continue.)

At the main menu, press C to see information on your COM ports. Under the listing for each port, check the heading "UART Chip Used." If MSD lists the number as 8250 or 16450 instead of 16550AF, consider upgrading your serial card.

If your serial card is an older one with a socketed UART, just purchase a 16550AF chip set (it costs around \$10), remove the old chips, and substitute the new ones. (The 16550 chip set consists of the main 16550AF UART and two smaller supporting chips.) On most current I/O cards, however, the chips are soldered; you'll have to retire them in favor of a replacement card. Usually, so-called multi-I/O cards and integrated IDE-I/O cards equipped with high-speed serial ports cost \$25 to \$50.

—Lenny Bailes



## ELECTRONIC BOOKMARKS

# Three Ways to Beat the Batch

*Getting around the limitations of DOS's batch-file language takes ingenuity. Here's how one writer beat the system to solve a troublesome problem.*

by Eric Maloney

I've been playing with three different ways to solve a nagging DOS problem. I want to write a simple batch file that can save and restore a subdirectory automatically—much the same way a bookmark keeps track of my page after I've closed the book and gone off to do other things.

The hitch is that my electronic bookmark involves setting an environment variable in a batch file to a value displayed by a DOS command—and DOS provides no easy way to do that. (See the accompanying sidebar "Environmental Awareness," page 40, for a quick explanation of this important DOS feature.)

Here's a simple example. The batch file TEST.BAT sets FILENAME as a parameter to a filename typed at the DOS prompt with this line:

```
SET FILENAME=%1
```

*Eric Maloney is the former editor in chief of 80 Micro, the founding editor of PC Resource, and the former editor in chief of LAN Technology. He's DOS World's editor at large.*

When you type the following line:

```
TEST.BAT LETTER.TXT
```

DOS reads the SET command like this:

```
SET FILENAME=LETTER.TXT
```

So far, so good. But how do you set a variable to a value that a DOS command displays? For example, let's say that TEST.BAT includes the command CD to show the current directory. Our goal is to put that directory into a variable called CURDIR. In other words, we want a command whose logic looks like this:

```
SET CURDIR=[output from CD]
```

Alas, DOS has no command that uses this logic. Its batch-file language won't let you assign such output directly to a variable; you can do it only indirectly.

To remedy this situation, I've come up with three methods—none of them perfect. They all yield the same result, but each has strengths that might make it better for par-

ticular jobs. The version that works for you will depend on the kind of batch file you're writing, the purpose for which you'll be using it, and how ambitious you're feeling today.

## Method 1: A Second Batch File

The most common solution is to maintain a second batch file, which sets the environment variable and returns you to the main batch file. To understand this better, let's flesh out my bookmark example.

My main batch file, MARK.BAT, remembers the current directory whenever I type MARK. Then, when I'm in another directory, I type MARK \, and MARK.BAT returns me to the original directory.

In version 1 of this batch file, which I'll call MARK1.BAT (see the accompanying program listing, page 41, top), I set the current directory by passing CD's output to SETIT.BAT. SETIT.BAT consists of this line:

```
SET CURDIR=
```

SETIT.BAT is a copy of a permanent helper file called SETIT.DAT,



(see listing, facing page, middle) which I create with a word processor and keep with MARK1.BAT in my BAT subdirectory.

As you may know, SETIT.BAT can't end with a carriage return. If it does, the redirected output will append to SETIT.BAT as a second line, and SETIT.BAT won't work. The easiest way to create such a short batch file is with COPY CON. At the DOS prompt, type the following line:

```
COPY CON SETIT.BAT
```

Then type this line:

```
SET CURDIR=
```

Instead of pressing the Enter key at the end of the line, though, press Ctrl+Z, then Enter.

Here's what the essential lines of MARK1.BAT look like:

```
COPY C:\BAT\SETIT.DAT
C:\BAT\SETIT.BAT
CD>>C:\BAT\SETIT.BAT
CALL C:\BAT\SETIT.BAT
DEL C:\BAT\SETIT.BAT
```

The first line copies SETIT.DAT to SETIT.BAT. The reason for SETIT.DAT

is simple: I need a clean SETIT.BAT each time I append data to it. Otherwise, SETIT.BAT will eventually comprise a pile of useless directory PATHS.

The second line redirects the output from CD to the end of SETIT.BAT, using double angle brackets (>>). SETIT.BAT now refers to the subdirectory I want and looks like this:

```
SET CURDIR=C:\123\FILES
```

The third line calls SETIT.BAT, which sets the value of CURDIR and returns to MARK.BAT. Finally, the fourth line deletes SETIT.BAT, which is no longer needed.

Now that we have a way to set CURDIR, we can write a few more lines to do the work of returning to C:\123\FILES when we type MARK \. The batch file needs a few more lines for error handling, but here's the skeleton:

```
@ECHO OFF
IF "%1"==" " GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO END
:SETDIR
COPY C:\BAT\SETIT.DAT
C:\BAT\SETIT.BAT
```

```
CD>>C:\BAT\SETIT.BAT
CALL C:\BAT\SETIT.BAT
DEL C:\BAT\SETIT.BAT
:END
```

At first glance, using the permanent helper file SETIT.DAT might seem like a roundabout way to create SETIT.BAT. Why not let MARK1.BAT create SETIT.BAT on the fly with the ECHO command? Such a solution would eliminate the need for SETIT.DAT. The following command would do the trick:

```
ECHO SET CURDIR=>>SETIT.BAT
```

But this approach has one fatal flaw: No matter how you ECHO it, SETIT.BAT will always end with a carriage return. So redirecting output from the CD command to SETIT.BAT would look something like this:

```
SET CURDIR=
C:\123\FILES
```

When you subsequently call SETIT.BAT, it sets CURDIR to a null value, gives you a "File not found" error at the second line, and dumps you back to MARK1.BAT, mission unaccomplished.

MARK1.BAT's advantages are simplicity and speed. Its disadvantage is that you're dealing with a second file, SETIT.DAT, which must be available. If you pass your batch files around among friends and colleagues, chances are someone will get a copy of MARK.BAT without the accompanying support file.

Also, the batch file must include the pathnames of the files MARK1.BAT is manipulating—a modification inexperienced users might be unable or reluctant to make.

## Method 2: A Single Batch File

In the second version, MARK2.BAT (see the accompanying listing, facing page, bottom), SETIT.BAT becomes a subroutine at the end of MARK2.BAT. That is, the last line of MARK2.BAT looks like this:

—E.M.

## ENVIRONMENTAL AWARENESS

The term *environment* can be daunting to novice DOS users—especially when faced with the cryptic "Out of environment space" message. Does it have something to do with landfills or holes in the ozone layer?

Not exactly. The DOS environment is a block of memory set aside for storing variables and their string (or text) values. The environment, which DOS creates each time you power up, acts as an electronic message board where DOS itself, batch files, and other programs check in and retrieve the information stored there.

You can produce your own environment variables from the command line or within your AUTOEXEC.BAT file. DOS users who understand how the environment operates can make it work for them by building temporary search paths, changing the keyboard's key assignments to create hot-key shortcuts, and monitoring the size of the environment so that they never encounter the DOS warning mentioned above.

Before you start tinkering, however, you might want to read "Creating the DOS Environment," by Ken Johnson (*DOS Resource Guide* #12, November 1993, page 26). This basic primer will clear the air of misunderstanding surrounding the environment and teach you a few techniques that will help you get more from your computer and from DOS.



SET CURDIR=

As is the case with MARK1.BAT, this line must not end with a carriage return. Because this batch file is much longer than SETIT.BAT, you'll want to use a word processor or text editor.

If you use EDIT.COM, which comes with DOS 5 and later, press Ctrl+P and Ctrl+Z key combinations at the end of the last line to suppress the carriage return.

MARK2.BAT copies itself to a second batch file, routes the data from the CD command to the duplicate, and runs the duplicate. Here's the essential code:

```
@ECHO OFF
%GOSET%
IF "%1"==" " GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO :END
:SETDIR
COPY C:\BAT\MARK2.BAT
C:\BAT\MARK2A.BAT
SET GOSET=GOTO DIRSET
CD>>C:\BAT\MARK2A.BAT
CALL C:\BAT\MARK2A.BAT
DEL C:\BAT\MARK2A.BAT
SET GOSET=
:END
REM>C:\END.BAT
C:\END
:DIRSET
SET CURDIR=
```

Let's assume we're running MARK2.BAT for the first time. The second line consists of an environment variable, GOSET, reserved for use by MARK2.BAT's duplicate, MARK2A.BAT. Since the variable doesn't have a value yet, MARK2.BAT sees it as empty, passes through it, and jumps to the :SETDIR subroutine. There, MARK2.BAT copies itself to MARK2A.BAT and sets GOSET to GOTO DIRSET. Then it redirects the output of CD to MARK2A.BAT. The last line of MARK2A.BAT changes to look like this:

SET CURDIR=C:\123\FILES

MARK2.BAT then calls MARK2A.BAT. When MARK2A.BAT hits line 2, it

**MARK1.BAT acts as an electronic bookmark by keeping track of your current directory. To return to it, simply type MARK1. This solution uses a separate batch file, SETIT.BAT, to set the environment variable CURDIR to the current directory.**

```
@ECHO OFF
IF "%1"==" " GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO END
:SETDIR
IF NOT EXIST C:\BAT\SETIT.DAT GOTO MESSAGE
COPY C:\BAT\SETIT.DAT C:\BAT\SETIT.BAT
CD>>C:\BAT\SETIT.BAT
CALL C:\BAT\SETIT.BAT
DEL C:\BAT\SETIT.BAT
GOTO END
:MESSAGE
CLS
ECHO The support file SETIT.DAT was not found
in the specified directory.
ECHO To create SETIT.DAT, type COPY CON SETIT.DAT.
Then type the following
ECHO line:
ECHO.
ECHO SET CURDIR=
ECHO.
ECHO Follow the equal sign immediately with Ctrl+Z
and then press Enter.
ECHO.
:END
```

End

**SETIT.DAT. The helper file for MARK1.BAT.**

SET CURDIR=

End

**MARK2.BAT performs the same function as MARK1.BAT, but is self-contained. The value of CURDIR is set in the last line of this batch file.**

```
@ECHO OFF
%GOSET%
IF "%1"==" " GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO :END
:SETDIR
COPY C:\BAT\MARK2.BAT C:\BAT\MARK2A.BAT
SET GOSET=GOTO DIRSET
CD>>C:\BAT\MARK2A.BAT
CALL C:\BAT\MARK2A.BAT
DEL C:\BAT\MARK2A.BAT
SET GOSET=
:END
REM>C:\END.BAT
C:\END
:DIRSET
SET CURDIR=
```

End

sees the variable as GOTO DIRSET and jumps to the :DIRSET subroutine, where it sets CURDIR with the now-modified SET command.

MARK2A.BAT then returns to MARK2.BAT, which cleans up by deleting MARK2A.BAT and resetting GOSET. Finally, MARK2.BAT executes a



little routine called :END to go back to DOS.

Normally, a batch file closes by dropping to an :END routine. Because the last line of MARK2.BAT must set CURDIR, however, we have to shut down the batch file from inside. MARK2.BAT redirects a REM statement to an empty batch file named END.BAT and then runs END.BAT, which has nothing to do and returns you to DOS.

MARK2.BAT always puts END.BAT into the root directory; otherwise, you'll have little END.BAT droppings all over your hard drive. (Note that END.BAT is zero bytes long; that is, it doesn't take up any space on your drive.)

MARK2.BAT is bigger than MARK1.BAT. That's one of its disadvantages, although at less than 350 bytes, it's hardly a storage hog. Also, MARK2.BAT is more convoluted. Novices won't have an easy time following its logic.

But MARK2.BAT's advantage is that it's self-contained; you can

give it away without worrying about users losing support files. As with version 1, you must make sure to include the full PATH of the program itself.

### Method 3: The COM Program Approach

MARK3.BAT (see the accompanying listing, right) is similar to MARK1.BAT. It uses a separate batch file, SETIT.BAT, to set the variable CURDIR to the current directory. MARK3.BAT creates SETIT.DAT with an ECHO statement, however, and then uses an assembly-language utility, NOCTRL.COM, to strip the carriage return and create SETIT.BAT. Thus, you don't need the permanent helper file, SETIT.DAT.

NOCTRL.COM is the work of *DOS World's* Technical Editor Hardin Brothers and appeared in issue #13 (January 1994, "Batch-File Medic: When a Simple Y/N Won't Do," page 36). It converts all control codes, including carriage returns, to spaces.

**MARK3.BAT is similar to MARK1.BAT, except that it creates SETIT.BAT with an ECHO and then strips the carriage return with the assembly-language utility NOCTRL.COM.**

```
@ECHO OFF
IF "%1"==" " GOTO SETDIR
IF "%1"=="\" CD %CURDIR%
GOTO END
:SETDIR
ECHO SET CURDIR=>SETIT.DAT
NOCTRL <SETIT.DAT>SETIT.BAT
CD>>C:\BAT\SETIT.BAT
CALL C:\BAT\SETIT.BAT
DEL C:\BAT\SETIT.BAT
DEL C:\BAT\SETIT.DAT
GOTO END
:END
```

End

**NOCTRL.SCR creates NOCTRL.COM, a utility that supports MARK3.BAT by stripping control characters from a file.**

```
N NOCTRL.COM
A 100
MOV AH,3F
SUB BX,BX
MOV CX,1
MOV DX,80
INT 21
JC 0125
CMP AX,1
JL 0125
MOV SI,80
MOV DL,[SI]
CMP DL,20
JNB 011F
MOV DL,20
MOV AH,2
INT 21
JMP 0100
INT 20
```

```
R CX
27
W
Q
```

End



## GIVE YOUR TEXT CHARACTER

If you need to add accents, umlauts, or other special characters or symbols to your word-processing documents, Windows' Character Map utility can help. Located in the Accessories group, Character Map provides a display of all text characters for a selected font. Choose the characters you need, copy them to the Clipboard, and paste them into your document.

For example, suppose you're working in Windows Write and using the New Times Roman font. To insert a German lowercase a with an umlaut, open Character Map and select New Times Roman in the font box. Click on the ä character and then on the Select button, or double-click on the character. Character Map transfers a duplicate of the letter to the Characters to Copy box. (The items in the Character Map display are small. To see a magnified view before making a selection, hold down the left mouse button.) To place additional items in Character to Copy, repeat the selection procedure.

Next, select the Copy button to transfer the character to the Windows Clipboard. When you return to your Write document, paste the character (or string) into your text or into Write's Replace dialog box. To perform the latter procedure, choose the Find option from the Find menu and type the sequence you want to replace in the Find What box. Press Enter or click on the Find Next button. Then choose the Find menu's Replace option and click on the Replace button. Click on Find Next to locate the next occurrence of the letter you want to replace and click on Replace again.

—Lenny Bailes

To create NOCTRL.COM, type in the listing NOCTRL.SCR (above) with a text editor and save it. Make sure you have Debug in a directory included in your PATH statement. (For more information, see the "Debug Scripts" section of "How to Use This Magazine," page 76 in this issue.)

Next, at the DOS prompt, type this line:



a software caching program. In general, the larger your cache, the better your hard disk's performance. For a 250MB or larger disk, make your cache at least 2MB.

Creating a large cache can be difficult if your PC doesn't have much memory to begin with, but if that's the case, upgrading your PC's RAM will yield a double benefit. Under normal circumstances, you can allocate a large cache, but reduce the cache size when necessary to make more memory available for running programs. (Windows, in combination with SMARTDRV, does that automatically.)

### The Controller Bottleneck

A software cache is at its best when your programs access the same data repeatedly. To get an overall speed-up when disk access is more random, you need to tackle the hardware.

All data going from disk to memory or *vice versa* passes through the disk controller. Plug an unambitious disk controller into an otherwise-fast system and you've got a bottleneck in the truest sense of the term.

The IDE disk controller installed in most PCs costs only about \$15. While these basic models offer adequate performance (I've used them for years), a better controller can improve your data transfer by shutting more during each operation or by performing the same operation faster.

If your PC has an open VESA local bus (VLB) slot, you can replace your old 16-bit ISA controller with a 32-bit VLB controller for about \$75. Your hard-disk system will then be able to transfer twice as much data with each operation. The transfer will also run at CPU speed instead of the 8MHz ISA bus speed—a significant improvement in a 66MHz PC.

The process of reading data from disk is the slowest part of any drive operation. You'll waste an average of 15 milliseconds (nearly one million CPU cycles at 66MHz) each time the controller has to position the hard

disk to a new area. But here's the good news: By adding a smart hardware cache directly to the controller card, you can reduce—or often eliminate—that delay.

A caching controller can reduce the apparent disk seek time from about 15 milliseconds to less than 0.3 milliseconds by anticipating your disk needs.

For example, assume that an application needs to read ten sectors of data and requests them one at a time. On the first sector request, the caching controller must position the disk and pay the 15-millisecond seek penalty. But instead of reading the one sector your application requested, the hardware on the controller board reads 50 sectors, storing them in its cache.

Because the operation is performed by the controller independent of the CPU, it doesn't affect your PC's operation at all. When the application makes subsequent requests, data is provided from the controller's cache, eliminating the disk-access delay entirely.

You can purchase a 16-bit ISA caching controller for under \$100; a typical VLB caching controller will set you back about \$125. These are bare-board prices, with no cache memory installed.

Both, however, typically sport four SIMM (single in-line memory module) slots, which you can stuff with up to 16MB (4 x 4MB) of cache memory.

### True Speed

It's natural to associate fast CPU speeds with PC performance, but sometimes the roadblocks to higher performance lie elsewhere.

Your hard disk is involved in nearly every PC operation, from loading and saving files to acting as virtual memory for Windows. Saddling your PC with a hard disk that's too small or too slow can rob you of performance.

Try the upgrades described here to remove those roadblocks and liberate your PC's potential. By fixing only what's broken, you may find there's new life in your old PC after all. ■



## BASIC INSTRUCTIONS, PLEASE

If you use QBasic, you probably need to refer to its on-line help files from time to time. Accessing them is easy: You click on the Help option in the top right corner of the screen, and an alphabetical list of QBasic commands appears. When you click on a command, the relevant information is displayed. Often, the explanation includes one or more examples of how to use the command.

Then comes the hard part: remembering the information or the command example long enough to apply it to the program on which you're working. If you need extra help, you have three options: leaving the help screen open while you work, making a printout, or copying the important parts of the explanation to your program. Choosing to leave the help screen open is often the most effective option, but only if you reduce the number of help lines displayed by clicking on the up-arrow you'll see under the help display and toward the right edge of the screen. (You may not reduce the width of the display.)

To produce a printout, turn on your printer, bring up help for the command you're interested in, and click on the File menu's Print option. Take the printer off line and press its form-feed button to begin printing. To copy program examples or other information into your program, highlight the lines you want to use. Pull down the Edit menu, click on Copy, and press the Esc key to return to your program. Position the cursor where you want to place the help information, open the Edit menu, and click on Paste.

—Lane Olinghouse



# A Better DOS Than DOS

*It's compact, it's versatile, it's a great buy: Here's how 4DOS increases DOS's command-line and batch-file power, all in one neat shareware package.*

by Jeff Holtzman

**H**ow'd you like a better DOS without giving up tens of megabytes of disk space to install OS/2 or Windows? For a meager 1.5 megabytes, you can install a shareware program called 4DOS, from JP Software, that will increase your command-line power by a factor of ten or more.

4DOS 5.0 is available on CompuServe, directly from the developer (\$49 plus \$6 shipping; 617-646-3975 or 800-368-8777 for orders), and from BBSes everywhere. An older version of the program, NDOS, is included with Symantec's Norton Utilities 8.0 (\$179; 408-253-9600 or 800-441-7234). 4DOS runs under all DOS versions produced by IBM, Microsoft, and Novell; it also runs under OS/2 and Windows. In addition, JP Software has developed highly compatible native versions of the package that run under OS/2 and Windows NT (\$49 each).

*Jeff Holtzman is manager of information development at BRL & Company, a systems integrator based in Ann Arbor, Michigan.*

As a replacement for DOS's COMMAND.COM, 4DOS is aimed almost entirely at providing command-line and batch-file power, which in turn aid file and disk management. There's syntax to learn, but rewards await those who persevere.

## Command-Line Processing

4DOS's enhanced command-line processing lets you recall, edit, and reexecute previously entered command lines, much like the DOSKEY utility that has been part of MS-DOS since version 5. 4DOS goes far beyond DOSKEY, though. For example, you can pop up one window that shows prior command lines and another that shows prior directories visited. In either case, just move the cursor to the one you want, press Enter, and voilà.

Still another feature is filename completion. Let's assume, for example, that you want to edit your AUTOEXEC.BAT file.

Normally, you'd log onto your boot drive, change to the root directory, and then type the name of your editor (we'll use DOS's EDIT for

these examples) with the complete filename. Under 4DOS, however, after getting to the correct drive and directory, you'd type EDIT A and press the Tab key; 4DOS fills in the remainder of the filename for you.

If you have more than one file beginning with A, just press Tab several times until the filename you want comes up. Or you can narrow the initial selection by typing AU, followed by Tab, to cycle through only the files beginning with those two letters. You can use filename completion with any internal command (for example, DIR and CD) or external command.

Another nice feature is the ability to run multiple commands on one command line (or a line in an alias or batch file, covered below). I'll use this trick over and over in what follows, so make sure you understand the syntax. All you have to do is separate each command from the next with a caret symbol (^).

The preceding AUTOEXEC.BAT example involved three steps: changing drive, changing directory,



and calling the editor. 4DOS, however, lets you do it in one fell swoop, as follows:

```
C: ^ CD \ ^ EDIT AUTOEXEC.BAT
```

Next, create an alias for that string of three commands. Doing so is simplicity itself:

```
ALIAS EA=C: ^ CD \ ^ EDIT  
AUTOEXEC.BAT
```

Thereafter, whenever you type EA at the command line, 4DOS will place you in the root directory of your C: drive and invoke your editor with the specified file.

"Okay," you say, "that's cute, but I could create a batch file that would do exactly the same thing." That's true, but aliases have two big advantages over batch files: They run faster, and they take up less disk space.

Aliases run faster because once loaded, they're always in memory. They occupy less disk space because you can often store many aliases in a single file, whereas each batch file is by definition a separate file.

### Batch-File Bonanza

The best way to check out 4DOS's batch-file features is to look at one: SMALLFRY.BAT, a file-maintenance utility (see the first listing, right). It scans your hard disk for files that are smaller than the disk space they occupy.

Many users don't realize that small files—even those that are only a few bytes long—can be space hogs. The reason is that DOS allocates space in units called *clusters*.

A file must occupy at least one cluster, no matter how small the file might actually be. For example, my hard drive uses 8K (8192 bytes) worth of clusters. A 2K batch file will take up 8K, wasting 6K of storage.

Here's another example. If you're a Windows user and like to collect icons, each file is 766 bytes long. If you've got 100 icons, you might think you're using only 76,600 bytes. Not so. On my drive, those icons would use  $100 * 8192 = 819,200$  bytes, or almost a megabyte of space.

The first step toward resolving this problem is to determine your cluster size. Then you have to find the files that are smaller than a cluster. Finding the cluster size is easy; just run DOS's CHKDSK program. One of the values it reports reads something like this:

```
xxxx bytes in each allocation unit
```

xxxx represents cluster size in bytes.

Finding the small files is where 4DOS comes in. 4DOS (version 5 and later) can filter directory listings according to criteria such as time, date, and size. So, for example, to find all files whose cluster size is less than 8192, you'd type the following:

```
DIR *.* /[S1,8192] /S
```

The parameter /S at the end means "search the current directory and all its subdirectories." The parameters in square brackets specify a size range. If you start the range with 0 (zero), the listing will include zero-byte files, but it will also include directory entries. Luckily, the following commands get around the problem:

**SMALLFRY.BAT finds your hard drive's cluster size and locates files that are smaller than that value.**

```
@ECHO OFF  
LOADBTM ON  
SETLOCAL  
IF "%1" == "" GOTO SYNTAX  
IF NOT EXIST %1\NUL GOTO SYNTAX  
ECHO Please be patient . . .  
CHKDSK %1 | FIND "in each alloc" | INPUT %X ^ SET X=%@WORD[0,%X]  
ECHO Searching for files with fewer than %X bytes on drive %1.  
ECHO.  
DIR E: /SKFA:-D /[S0,%X]  
GOTO DONE
```

```
:SYNTAX  
TEXT
```

This program lists all files less than or equal to the cluster size of the specified disk drive.

Syntax: C:>SMALLFRY D:

You can optionally redirect the output of this program to an ASCII file of your choice.

```
Syntax: C:>SMALLFRY D: >SMALLFRY.TXT  
ENDTEXT  
  
:DONE  
ENDLOCAL
```

End



```
DIR *.* /S[0,8192] /S /A:-D
```

The parameter /A:-D tells 4DOS to ignore directories. SMALLFRY.BAT combines the two functions—iden-

tifying your drive's cluster size and finding the small files—into one batch file. Here's how.

The first line tells 4DOS not to echo each line as it executes. Line 2

tells 4DOS to load the whole batch file into memory, rather than process it line by line from disk, as COMMAND.COM does. You can also give batch files the extension .BTM

## DOS TIP

### TAKE THE SHORT ROAD

DOS's ANSI.SYS driver includes many interesting features; among them is its ability to assign text strings to function-key sequences. You can assign text strings to any of the function keys (F1 to F12) or combine any function key with Ctrl, Alt, or Shift.

If that sounds esoteric, think of how many times a week you type DIR or FORMAT A:. You can save yourself keystrokes by assigning DIR to F1, for instance, and FORMAT A: to F2. Thereafter, you execute these commands by pressing F1 or F2.

You might also use variations on a function-key sequence to call similar commands, perhaps using the Alt+F1 key combination for DIR /O:G (to produce an alphabetical list of files, with directories first), Ctrl+F1 for DIR /P /W (to produce a wide listing, one page at a time), and the Shift+F1 combination for DIR /A:H (to see a list of hidden files).

To make the connection between a text string and a function-key sequence, you need two main ingredients: a command that calls ANSI.SYS at start-up and a batch file that uses a PROMPT command to assign your chosen key combinations. You call ANSI.SYS in your CONFIG.SYS file, using a command like this:

```
DEVICE=C:\DOS\ANSI.SYS
```

Your PROMPT command will look like this:

```
PROMPT $E[xx;"string"p
```

where *xx* is zero and a semicolon (0;) followed by a permissible ASCII value (see the accompanying "Function-Key Values" table), and *string* is the command you want to execute.

For example, suppose you want to assign the DIR command to F1. The corresponding PROMPT command is as follows:

```
PROMPT $E[0;59;"DIR"p
```

You use 0;59 because that's the value that corresponds to the F1 key.

To avoid typing this command at the beginning of every DOS session, create a batch file called P.BAT containing the line.

After assigning your function-key values, you'll need to add a PROMPT command that tells DOS how you want the DOS prompt to look. P.BAT might then contain these three lines:

```
PROMPT $E[0;59;"DIR"p
PROMPT $E[0;60;"FORMAT A:"p
PROMPT $P$G
```

To activate these commands at start-up, add this line to your AUTOEXEC.BAT:

```
CALL P.BAT
```

To add a carriage return to a PROMPT command—so that it executes automatically—add \$\_ to the end of the PROMPT string:

```
PROMPT $E[0;59;"DIR$_"p
```

For instance, if you add \$\_ to the first line of P.BAT, DOS will automatically display a directory at start-up.

One final bit of advice: Avoid assigning F3 (0;61) in a PROMPT statement by itself, because it's already programmed. When you type F3 at the DOS prompt, DOS displays the most recently executed command.

—Lenny Bailes

### FUNCTION-KEY VALUES

Key	By Itself	With Shift	With Ctrl	With Alt
F1	0;59	0;84	0;94	0;104
F2	0;60	0;85	0;95	0;105
F3	0;61	0;86	0;96	0;106
F4	0;62	0;87	0;97	0;107
F5	0;63	0;88	0;98	0;108
F6	0;64	0;89	0;99	0;109
F7	0;65	0;90	0;100	0;110
F8	0;66	0;91	0;101	0;111
F9	0;67	0;92	0;102	0;112
F10	0;68	0;93	0;103	0;113
F11	0;133	0;135	0;137	0;139
F12	0;134	0;136	0;138	0;140



**SCRUB.BAT** deletes files with specified extensions from the current directory and component subdirectories.

```
@ECHO OFF
LOADBTM ON
SETLOCAL
SET EXTS=BAK CHK OLD TMP $$$ JNK

ECHO This program will delete all files
ECHO with the following extensions
ECHO.
ECHO      %EXTS
ECHO.
ECHO from the current directory and from
ECHO all directories beneath it.
ECHO.
```

ECHO It will also delete all hidden and ECHO read-only files from those directories, ECHO as well as empty directories.

```
INKEY /K"YN" Do you want to continue (Y/N)? %%YESNO
IF "%YESNO" NE "Y" GOTO ALLDONE
```

```
INKEY /K"YN" Are you sure (Y/N)? %%YESNO
IF "%YESNO" NE "Y" GOTO ALLDONE
```

```
FOR %X IN (%EXTS) DO DEL *.*%X /SXYZ
```

```
:ALLDONE
ENDLOCAL
```

*End*

**GET\_PW.BAT** sets up password protection for batch-file termination; passwords are coded within the batch file itself. If you install GET\_PW.BAT in your AUTOEXEC.BAT file, you can adapt it to prevent unauthorized users from booting your PC.

```
@ECHO OFF
LOADBTM ON
ON BREAK GOTO START
:START
INPUT /P Please enter password: %%PASSWORD
IF "%PASSWORD%" == "xxxx" GOTO DONE
IF "%PASSWORD%" != "Jeff" GOTO START
:DONE
```

*End*

**GET\_PW1.BAT** is a variation on the first security program at left; this one accesses an external password file to verify the user.

```
@ECHO OFF
LOADBTM ON
ON BREAK GOTO START
:START
INPUT /P Please enter password: %%PASSWORD
FOR %PPP IN (@PASSWORD.TXT) DO IF "%PPP" ==
"%PASSWORD" GOTO DONE
GOTO START
:DONE
```

*End*

to force in-memory processing automatically. In-memory batch-file processing gives 4DOS a speed advantage over COMMAND.COM.

In addition, note that JP Software provides a batch-file compiler to registered 4DOS users. This compiler reduces BAT and BTM files to compressed, uneditable files suitable for distribution.

### The Heart of the Matter

Back to the batch file. Line 3 sets up a "local" environment, restored at the end of the program (line 28). That way you don't have to worry about overwriting preexisting variables accidentally or about "cleaning up" after you're done.

Lines 4 and 5 check whether the user specified a valid drive. It's not foolproof. Network drives and drives created with the ASSIGN or SUBST command will pass the test, but will make CHKDSK fail at the

next step. Can you think of a way around this limitation?

The real work starts in line 7. First, the program runs CHKDSK on the specified drive. Then it pipes its output to FIND, which searches for a line containing the desired information: the number of bytes per cluster.

That line is in turn piped to 4DOS's INPUT command, which stores it in environment variable X. Finally, using 4DOS's @WORD function, you reset X to be the first word of X, which happens to be the desired value.

Lines 8 and 9 inform the user of what's happening; then line 10 searches for files of that size or less.

Note that line 14 contains a TEXT command; it's much more efficient than several ECHO statements as a way of displaying multiple lines of text.

4DOS also offers several internal functions, such as @WORD, to process strings and get system information. (Full discussion of that topic would warrant a separate article.)

### More Batch Techniques

Several other 4DOS batch files have become staples of my computing environment. Space precludes a line-by-line description of each one, but I'll point out some of the more interesting features.

SCRUB.BAT (see the accompanying program listing, top) uses 4DOS's enhanced DEL command to delete all files with specified extensions from the current directory and its subdirectories. Specified file types are stored in the environment variable EXTS. You can edit this variable as necessary for your system.

Think about running it automatically once a week with 4DOS's \_DOW variable—something like this:



IF "%\_DOW" == "Fri" THEN CALL SCRUB.BAT

GET\_PW.BAT (see the accompanying listing, page 51, left) forces the user to enter a password before the batch file will terminate. For simplicity, passwords are hard-coded right into the batch file. You can call GET\_PW.BAT from your AUTO-EXEC.BAT (or simply embed it therein) to prevent unauthorized users from booting your PC. It's not fool-proof, but it's a start.

Note line 3: The ON BREAK statement prevents any user from pressing Ctrl+C to break out of the batch file. I'll use this feature in a "prank" program (APRIL\_F.BAT) at the end of this article.

GET\_PW1.BAT (see the program listing, page 51, right) also forces the user to enter a password. This version, however, reads an external password file line by line to verify the user. You can set the password file's hidden, read-only, and system attributes to increase security.

## Menu Design

Here's still another compact example of 4DOS power at work. MENU-DOS.BAT (see the listing, right) uses 4DOS's extensive screen-control functions to create a menuing system that allows single-keystroke access to as many as 18 DOS programs. The program's design is flexible, and you can customize it fairly easily.

All important screen positions are defined as constants in the early part of the program. Most are calculated using 4DOS functions based on the screen position of the primary menu window:

- UR=upper row
- UC=upper column
- LR=lower row
- LC=lower column

To customize screen appearance, simply edit the desired strings, colors, and window size.

Here's the basic logic. The overall processing loop is as follows:

1. As long as the environment variable %KEY doesn't equal X (for *exit to DOS*), display the menu window on screen and get keystrokes from the user.

2. When the user enters a valid key-stroke, run the program associated with the corresponding menu item.

3. When the program ends, redisplay the menu and get another keystroke.

**MENU DOS.BAT's menu-creation system provides for single-key access to as many as 18 DOS programs.**

```
@ECHO OFF
LOADBTM ON
REM SETLOCAL

REM DEFINE CONSTANTS
SET TITLE=MY LITTLE MENU SYSTEM
SET PRMPT=CHOOSE AN ITEM:

REM DEFINE SCREEN POSITIONS
SET UR=3
SET UC=20
SET LR=19
SET LC=60
SET CENTER=%@EVAL[%LC-%UC]
SET LS=2
SET TITLELEN=%@EVAL[%LEN[%TITLE]]
SET TITLEC=%@EVAL[%CENTER-%TITLELEN\2]
SET TITLER=%@EVAL[%UR+2]
SET COL1POS=%@EVAL[%UC+3]
SET COL2POS=%@EVAL[%CENTER+1]
SET PRMPTPOS=%@EVAL[%LR-2]

REM DEFINE SCREEN COLORS
SET FG=BRIGHT YELLOW
SET BG=BLUE
SET FILL=MAGENTA

SET KEY=Z          ^REM SET DEFAULT TO NONUSED VALUE

DO WHILE "%KEY" NE "X"  ^REM THIS IS THE MAIN LOOP
CLS
REM DRAW BOX AND PRINT TITLE
COLOR BLACK ON BLUE
DRAWBOX %UR %UC %LR %LC %LS %FG ON %BG FILL %FILL
SCREEN %TITLER %TITLEC %TITLE

REM DRAW COLUMN 1 MENU ENTRIES
REM EACH MENU ITEM CAN BE 13 CHARACTERS LONG
SCREEN %@EVAL[%UR+4] %@EVAL[%COL1POS] 1. MENU ITEM
SCREEN %@EVAL[%UR+5] %@EVAL[%COL1POS] 2. MENU ITEM
SCREEN %@EVAL[%UR+6] %@EVAL[%COL1POS] 3. MENU ITEM
SCREEN %@EVAL[%UR+7] %@EVAL[%COL1POS] 4. MENU ITEM
SCREEN %@EVAL[%UR+8] %@EVAL[%COL1POS] 5. MENU ITEM
SCREEN %@EVAL[%UR+9] %@EVAL[%COL1POS] 6. MENU ITEM
SCREEN %@EVAL[%UR+10] %@EVAL[%COL1POS] 7. MENU ITEM
SCREEN %@EVAL[%UR+11] %@EVAL[%COL1POS] 8. MENU ITEM
SCREEN %@EVAL[%UR+12] %@EVAL[%COL1POS] 9. MENU ITEM

REM DRAW COLUMN 2 MENU ENTRIES
```



To use this menuing system, just enter meaningful names for the menu items (lines 39 to 57), as well as corresponding program (or batch-file) names following the THEN statements in lines 73 to 89. Also note the program's IFF and GOSUB statements. Just by themselves, these two handy programming commands enhance 4DOS's

**APRIL\_F.BAT's simulated DOS prompt puts users into an endless loop, echoing back the statement "Unknown command" over and over. Smart users may catch on that they can type APRIL FOOL to halt the program.**

```

SCREEN %%EVAL[%UR+4] %%EVAL[%COL2POS] A. MENU ITEM
SCREEN %%EVAL[%UR+5] %%EVAL[%COL2POS] B. MENU ITEM
SCREEN %%EVAL[%UR+6] %%EVAL[%COL2POS] C. MENU ITEM
SCREEN %%EVAL[%UR+7] %%EVAL[%COL2POS] D. MENU ITEM
SCREEN %%EVAL[%UR+8] %%EVAL[%COL2POS] E. MENU ITEM
SCREEN %%EVAL[%UR+9] %%EVAL[%COL2POS] F. MENU ITEM
SCREEN %%EVAL[%UR+10] %%EVAL[%COL2POS] G. MENU ITEM
SCREEN %%EVAL[%UR+11] %%EVAL[%COL2POS] H. MENU ITEM
SCREEN %%EVAL[%UR+12] %%EVAL[%COL2POS] X. EXIT TO DOS

REM DRAW PROMPT AND GET INPUT
SCREEN %PRMPTPOS %%EVAL[%CENTER-%LEN[%PRMPT]\2] %PRMPT`
INKEY %KEY
SET KEY=%@LOWER[%KEY]
GOSUB EXECUTECOMMAND
ENDDO

SCREEN 22 0
REM ENDLOCAL
COLOR WHITE ON BLACK
QUIT

:EXECUTECOMMAND
  IFF "%KEY" == "1" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "2" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "3" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "4" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "5" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "6" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "7" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "8" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "9" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "A" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "B" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "C" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "D" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "E" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "F" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "G" THEN ^ GOSUB ECHOCOMMAND
ELSEIFF "%KEY" == "H" THEN ^ GOSUB ECHOCOMMAND
ENDIF
RETURN

:ECHOCOMMAND
ECHO.
ECHO.
ECHO %KEY
ECHO.
ECHO.
PAUSE
RETURN

```

*End*

```

@ECHO OFF
LOADBTM ON
SETLOCAL
ON BREAK GOTO START
ECHO.
:START
ECHOS `C:>`
INPUT %AFP
IFF "%AFP" == "" THEN
  GOTO START
ELSEIFF "%AFP" ==
  "APRIL FOOL" THEN
  ECHO.
  ECHO Thanks for
    being a sport!
  ECHO.
  ECHO See you
    next April!
  ECHO.
  GOTO DONE
ELSE
  ECHO UNKNOWN COMMAND
    "%AFP"
  ECHO.
  GOTO START
ENDIF
:DONE

```

*End*

powerful batch language a thousandfold over DOS's.

### Fun and Games

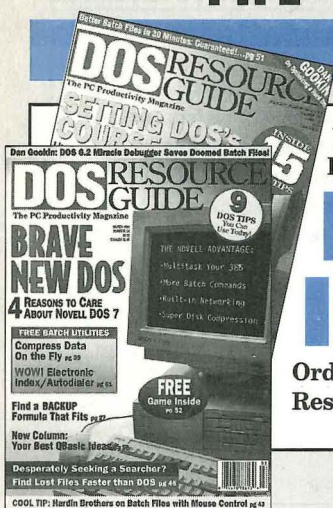
Finally, APRIL\_F.BAT (see the sixth listing, above) presents a simulated DOS prompt that does nothing except echo back the statement "Unknown command" plus whatever the user types. It looks and feels just like the familiar C:> DOS prompt. But the only way to exit this program is to type APRIL FOOL.

As with the password mechanism discussed earlier, the program's ON BREAK command prevents the Ctrl+C key combination from terminating the program prematurely. I've caused a fair amount of friendly consternation among some pretty sophisticated users with this one. ■



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## Q B A S I C G A M E

# Have a Blast

*It's you against the system—fire up QBasic, load BLASTER.BAS, and take a shot at beating your computer at this addictive game of strategy.*

by Robert K. Fink

## B

ad command or filename." "Access denied."  
"NEXT without FOR."

Does it seem as though your computer and its software are always getting the better of you? Here's your chance for revenge—and a little entertainment at the same time. My QBasic strategy game, BLASTER.BAS (see the listing on page 56), pits you against the computer. You take turns blasting away at a 10-by-10 grid of numbers, racking up points as you go. But to come out the winner, you can't just shoot from the hip—you have to plan your attack.

### Entering a Blasting Zone

To get a copy of BLASTER.BAS, you can take the educational route or the easy way out. As someone who has learned a lot by typing in and experimenting with other programmers' listings, I recommend the educational route: firing up QBasic and typing in the listing and its

subroutines and functions. If you're looking for more immediate gratification, though, you can download the listing from the *DOS World* BBS. (See "How to Use This Magazine," page 76 in this issue, for further information.)

Type QBASIC at the DOS prompt to load QBasic, then press Esc to clear the screen. Before you go any further, open the File menu, choose the Save As option, type BLASTER.BAS in response to the prompt for a filename, and press Enter. If you don't want to store the listing in the current directory, be sure to provide the appropriate PATH when you name the program.

Begin typing in the listing, starting with the DEFINT A-Z statement. Skip the 11 DECLARE statements that follow it; QBasic adds these automatically later on. Continue typing in the program lines as shown in the listing, saving your work periodically. When you reach the END IF statement in the program section labeled RESTART:, save your work again. You've come to the end of the program; the rest of the listing is composed of subroutines and functions.

To create each of these next sections, select the New Sub option from the Edit menu and assign it the name shown in the listing. QBasic fills in the first part of the first line of the subroutine, as well as the last line. You must type in everything in between. When you save the main program, QBasic saves the subprograms or functions along with it, adding the proper DECLARE statements at the top of the main program. Because the main module includes a DEFINT A-Z statement and subprograms and functions inherit the main module type, QBasic also adds the DEFINT A-Z statements for you. After typing in the final subprogram, ZING, save your work one last time.

To run the program, press Shift+F5 or choose the Run menu's Start option. If you've made typing errors, print the listing so that you may more easily compare your program to the one published here.

### Playing the Numbers

With a working version of BLASTER.BAS on hand, you're ready to play. To call up the program from the DOS prompt, just type this command:

*Robert K. Fink teaches engineering technology at Sinclair College in Dayton, Ohio. He's been involved with computers since the days of the Univac II.*



## QBASIC GAME

QBASIC /RUN BLASTER.BAS

Or create this two-line batch file, called BLAST.BAT, so that you can load the game by typing BLAST at the DOS prompt:

```
@ECHO OFF
QBASIC /RUN BLAST.BAS
```

When you're ready, press any key to start a game. BLASTER.BAS begins by offering you the choice of going first or letting the computer make the opening move. To go first, press Y; to let the computer go first, press C. You increase your chances of winning by going first, so this time around, press Y.

But before you make your first move, take a few moments to study the screen. At the top is a collection of colored shapes labeled *Scoring Patterns*. In the center is a game board consisting of multicolored squares on which numbers are superimposed; the board's ten rows are labeled with the numbers 0

**In BLASTER.BAS, you and the computer take turns blasting away at a 10-by-10 grid of numbers.**

```
'NUMBER BLASTER/BLASTER.BAS
'R. K. Fink 9/14/94
DEFINT A-Z
DECLARE SUB LEGEND ()
DECLARE SUB BUILDBRD ()
DECLARE FUNCTION GETMOVE (ROW)
DECLARE SUB SHOWMOVE (ROW)
DECLARE SUB SHOWSCORE (YRSCORE, COMPSCORE)
DECLARE FUNCTION CALCMOVE (ROW, COL, CLR)
DECLARE SUB ZING (ROW)
DECLARE FUNCTION COMPMOVE (ROW)
DECLARE SUB GENERATE ()
DECLARE SUB SHOWBLKS (SCHEMENO)
DECLARE SUB CLEARBRD ()

DIM SHARED SCHEME1(0 TO 15) AS INTEGER
DIM SHARED SCHEME2(0 TO 15) AS INTEGER
DIM SHARED SCHEME3(0 TO 15) AS INTEGER
DIM SHARED SCHEMENO AS INTEGER
DIM SHARED BLKVALUE(9 TO 20, 19 TO 30) AS INTEGER
DIM SHARED ROW, COL, CLR, VALUE, TURN AS INTEGER
DIM SHARED SCORE, COMPSCORE, YRSCORE AS INTEGER

'Data for scoring patterns
DATA 2,11,1,2,22,7,2,29,4,3,8,2,3,11,1
DATA 3,14,3,3,17,5,3,18,5,3,21,7,3,25,6
DATA 3,29,4,4,14,3,4,26,6,4,29,4

SCREEN 0: CLS : WIDTH 40

DO
  'Screen dazzler and randomizer
  CALL GENERATE
  CALL SHOWBLKS(1)
  CALL SHOWBLKS(2)
  LOOP UNTIL INKEY$ <> ""

  PALETTE USING SCHEME3

'Program begins here

  COLOR 4, 0
  CLS : LEGEND: BUILDBRD
  COLOR 4, 0

  LOCATE 23, 1: PRINT "Who's first...<y>ou or the
    <c>omputer";

DO
  X$ = INKEY$

  IF UCASE$(X$) = "C" THEN YOU = 1: EXIT DO
  IF UCASE$(X$) = "Y" THEN YOU = 0: EXIT DO

LOOP

  LOCATE 23, 5: PRINT SPC(34); : CALL CLEARBRD
  IF YOU THEN GOTO COMPLAY

'You go first
RESTART:
  CALL SHOWMOVE(GETMOVE(ROW))
  YRSCORE = YRSCORE + CALCMOVE(ROW, COL, CLR)
  CALL SHOWSCORE(YRSCORE, COMPSCORE)

'Now the computer goes
COMPLAY:
  CALL SHOWMOVE(COMPMOVE(ROW))
  IF ROW = -1 THEN GOTO FINISHED
  COMPSCORE = COMPSCORE + CALCMOVE(ROW, COL, CLR)
  CALL SHOWSCORE(YRSCORE, COMPSCORE)
  GOTO RESTART

FINISHED:
  BEEP

  LOCATE 23, 1: PRINT "OK. Final Scores >>>>";
  SLEEP (5)

  LOCATE 24, 1
  PRINT "Press Enter to replay, Esc to quit";

DO
  X$ = INKEY$
  IF X$ = CHR$(13) THEN RUN

  IF X$ = CHR$(27) THEN
    SCREEN 0: COLOR 7, 0: SYSTEM
    END IF

LOOP

DEFINT A-Z
SUB BUILDBRD
FOR N = 10 TO 19 'Column numbers
  LOCATE N, 5
  COLOR 7, 0
  PRINT STR$(N - 10);
NEXT N
FOR N = 10 TO 19
```



through 9. Because you elected to go first, a message at the bottom-left edge of the screen prompts you to make your move.

If the computer goes first, an "I'm thinking!" message appears. After the opening move, a scoreboard will appear at the lower-right edge of the screen.

The object of the game is to get the highest score. The color of the first square in a row determines the pattern of squares used to compute your score. The sum of the numbers in the chosen scoring pattern determines your score for each round. Scoring rules will become clearer if you examine the accompanying

screen shot, "Game in progress" (page 59, top), and the table, "Scoring Patterns Explained" (page 59, bottom).

Reading from left to right across your screen, the colors of the seven scoring patterns are green, dark blue, light blue, purple, white, yellow, and red. The table tells you what the shapes of the patterns

```
FOR M = 7 TO 18
LOCATE N, M
PRINT "-";
NEXT M: NEXT N
'Build the board
FOR N = 10 TO 19
FOR M = 20 TO 29
LOCATE N, M
VALUE = (RND * 6) + 1
BLKVALUE(N, M) = VALUE
COLOR 0, (RND * 6 + 1)
PRINT USING "#"; VALUE;
NEXT M: NEXT N
END SUB
```

```
DEFINT A-Z
FUNCTION CALCMOVE (ROW, COL, CLR)
SCORE = BLKVALUE(ROW, COL)
BLKVALUE(ROW, COL) = 0
COLOR 4, 0
SELECT CASE CLR
CASE 1 'Blue block
SCORE = SCORE + BLKVALUE(ROW - 1, COL)
BLKVALUE(ROW - 1, COL) = 0
LOCATE ROW - 1, COL: PRINT " ";
CASE 2 'Green (single block)
BLKVALUE(ROW, COL) = 0
CASE 3 'Cyan
SCORE = SCORE + BLKVALUE(ROW + 1, COL)
BLKVALUE(ROW + 1, COL) = 0
LOCATE ROW + 1, COL: PRINT " ";
CASE 4 'Red
SCORE = SCORE + BLKVALUE(ROW - 1, COL) +
BLKVALUE(ROW + 1, COL)
BLKVALUE(ROW - 1, COL) = 0: BLKVALUE(ROW + 1,
COL) = 0
LOCATE ROW - 1, COL: PRINT " ";
LOCATE ROW + 1, COL: PRINT " ";
CASE 5 'Magenta
SCORE = SCORE + BLKVALUE(ROW, COL + 1)
BLKVALUE(ROW, COL + 1) = 0
LOCATE ROW, COL + 1: PRINT " ";
CASE 6 'Yellow
SCORE = SCORE + BLKVALUE(ROW + 1, COL + 1)
BLKVALUE(ROW + 1, COL + 1) = 0
LOCATE ROW + 1, COL + 1: PRINT " ";
CASE 7 'White
SCORE = SCORE + BLKVALUE(ROW - 1, COL + 1)
BLKVALUE(ROW - 1, COL + 1) = 0
LOCATE ROW - 1, COL + 1: PRINT " ";
END SELECT
```

```
CALCMOVE = SCORE
END FUNCTION
```

```
DEFINT A-Z
SUB CLEARBRD
FOR N = 10 TO 19
FOR M = 7 TO 18
LOCATE N, M
PRINT " ";
NEXT M: NEXT N
END SUB
```

```
DEFINT A-Z
FUNCTION COMPMOVE (ROW)
LOCATE 23, 1
PRINT SPC(22);
LOCATE 23, 1
PRINT " I'm thinking! ";
SLEEP (2) 'Delay the computer
BIG = 0
ROW = 10: N = 10
GETBIGGEST:
FOR M = 20 TO 30
CHECK = BLKVALUE(N, M)
IF CHECK <> 0 THEN EXIT FOR
NEXT M
IF CHECK > BIG THEN
BIG = CHECK
ROW = N
END IF
N = N + 1
IF N < 21 GOTO GETBIGGEST
IF BIG <> 0 THEN
CALL ZING(ROW)
ELSE ROW = -1
END IF
COMPMOVE = ROW
END FUNCTION
```

```
DEFINT A-Z
SUB GENERATE
FOR N = 1 TO 15
SCHEME1(N) = INT(RND * 15)
SCHEME1(0) = 0
SCHEME2(N) = INT(RND * 15)
SCHEME2(0) = 0
SCHEME3(N) = N
SCHEME3(0) = 0
NEXT N
END SUB
```

continued on page 58



## QBASIC GAME

mean. To figure out how to use these patterns to decide your best move, check the screen shot. The color of the first square in row 0 represents red. If you choose row 0, your score for that round is governed by the red scoring pattern. Consequently, your score is  $2 + 0 + 1$  (the value of the first square in row 0 *plus* the value of the square above it *plus* the value of the square below it).

If you choose row 4, your score is higher. The first square represents yellow, so you get  $2 + 6$  (the value of the yellow square plus the value of the one diagonally below and to its right). To get the highest possible score for this round, you'd choose row 3, whose lead square represents white. You'd get  $4 + 3$  (the value of the white square plus the value of the one diagonally above and to its right).

Try it; you'll catch on after a few moves. Be careful, though; to win, you need to think before you act. Sometimes making the choice that gives you the highest score isn't the best strategy, because it gives the computer a chance to score big, as well. The program keeps a running score to tell you who's ahead.

If the computer clears the last squares from the game board, the program will prompt you to take

*continued from page 57*

```
DEFINT A-Z
FUNCTION GETMOVE (ROW)
COLOR 4, 0
AGAIN:
LOCATE 23, 1
PRINT SPC(20);
LOCATE 23, 1
PRINT "Your move. Which row?";
WHILE ROW = 0 OR ROW$ = ""
ROW$ = INKEY$
ROW = INSTR("0123456789", ROW$)
WEND 'Wait for a number key
ROW = ROW + 9
CALL ZING(ROW)
LOCATE 23, 1
PRINT SPC(20);
GETMOVE = ROW
END FUNCTION
```

```
DEFINT A-Z
SUB LEGEND
RESTORE
FOR N = 1 TO 14: READ I, J, K
LOCATE I, J: COLOR K: PRINT CHR$(219);
NEXT N
LOCATE 6, 11: PRINT "Scoring Patterns"
LOCATE 7, 5: PRINT STRING$(30, "-");
END SUB
```

```
DEFINT A-Z
SUB SHOWBLKS (SCHEMENO)
IF SCHEMENO = 1 THEN
PALETTE USING SCHEME1
ELSE PALETTE USING SCHEME2
END IF
GOSUB SHOWEM
EXIT SUB
```

```
SHOWEM:
FOR N = 10 TO 20
FOR M = 20 TO 30
LOCATE N, M
COLOR 0, (RND * 6 + 1), 0
CHAR = RND * 6
PRINT USING "#"; CHAR;
LOCATE N, M
NEXT M: NEXT N
```

```
LOCATE 3, 5
COLOR RND * 6, 0
PRINT "Ready for NUMBER BLASTER?"
PRINT
PRINT "          Press a key when ready..."
RETURN
END SUB
```

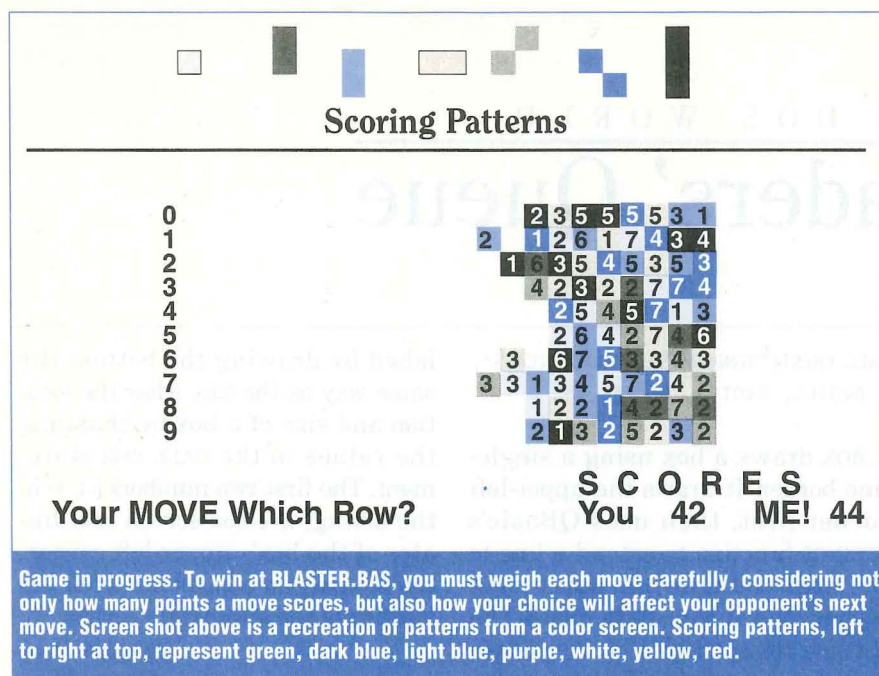
```
DEFINT A-Z
SUB SHOWMOVE (ROW)
IF ROW = -1 THEN EXIT SUB
FOR M = 20 TO 30
CLR = SCREEN(ROW, M, 1)
CLR = (CLR AND 112) / 16
IF CLR <> 0 THEN GOTO FOUND
NEXT M
'Row is empty
EXIT SUB
FOUND:
LOCATE ROW, M
PRINT " "; 'Null block
COL = M
END SUB
```

```
DEFINT A-Z
SUB SHOWSCORE (YRSCORE, COMPSCORE)
LOCATE 22, 24
COLOR 4, 0
PRINT "S C O R E S"
LOCATE 23, 24
PRINT SPC(15);
LOCATE 23, 24
PRINT "You"; YRSCORE; " ME!"; COMPSCORE;
END SUB
```

```
DEFINT A-Z
SUB ZING (ROW)
FOR M = 7 TO 18
COLOR 7, 0
LOCATE (ROW), M
PRINT "="; : FOR N = 1 TO 8000: NEXT N
LOCATE (ROW), M
PRINT " ";
NEXT M
END SUB
```

*End*





another turn. Press any of the permissible keys. BLASTER.BAS will display its "I'm thinking!" message once more, beep when it discovers that the game board is empty, post the final score, and ask you to press Enter to play another game or Esc to return to QBasic. Play continues even though no squares remain, because the computer won't make a mistake and choose an empty row, but a human might. If having the human player shoot a blank were the signal to end the game, play would end prematurely whenever the player chose an empty row.

### Home Improvements

After you've played a few rounds and mastered the rules of BLASTER.BAS, you may find yourself wishing for something a bit more refined. Go ahead—make some changes.

One simple alteration you might consider is adjusting the delays that control the speed at which the "bullet" blasts across the screen when you or your opponent makes a move. If you have an older, slower machine, shorten the delays in the subroutine called ZING by decreasing the maximum value of N (as written, the maximum value is 8000) until the bullets really do zing. On the other hand, if you have

a Pentium or a speedy 486, you may want to slow things down. These modern beasts perform so fast that you won't have a chance to see the computer's choice before it's your turn again. Try lengthening the delay by increasing the value of the number in COMPMOVE's SLEEP statement. There's no magic number; tinker with the value until you get a delay you find comfortable.

If you use a CGA system, don't use the "screen dazzler" at the start of the program, because it includes a PALETTE USING statement, which CGA doesn't support. Instead, insert a dummy RND calculation into a

loop, which would continue to execute until the user pressed a key. Or use a RANDOMIZE command instead, but that requires the user to type a starting number, which may get to be a bore. You can't simply eliminate the random seed, though, because without a means of starting the game randomly, you'll play the same game time after time.

If you're looking for a programming challenge, try for a more aggressive look-ahead strategy. At present, the game chooses the row whose leading square contains the highest number, putting the computer at a disadvantage. A good first step in making games played against the computer more difficult would be to have it search for the best possible scoring combination. Having the computer look beyond the first square in each row of the grid would involve examining, pattern by pattern, each row during each turn.

But I like BLASTER.BAS just the way it is, because it gives me a fighting chance of winning. And I'm sure I'm not the only computer user who enjoys the opportunity to beat a computer. Come to think of it, kids might appreciate it, too. Why not pass BLASTER.BAS on to a youngster who needs to brush up on basic math skills? It provides both practice with addition and a valuable lesson on the rewards of planning ahead. ■

## SCORING PATTERNS EXPLAINED

### Color of Square

green  
dark blue

light blue

purple

white

yellow

red

### Computing Your Score

use the value of the number in the square itself  
add the value of the square itself to the value of the one above it  
add the value of the square itself to the value of the one below it  
add the value of the square itself to the value of the one to its right  
add the value of the square itself to the value of the one diagonally above it and to the right  
add the value of the square itself to the value of the one diagonally below it and to the right  
add the value of the square itself to the values of the ones above and below it



# Readers' Queue

## Now See This

Because I often find graphs easier to understand than numbers, I've written two subroutines, CHART and BOX, which let me compare two integers visually. To show you how these programs work, I've created a short demo program, called BARDEMO.BAS (right). When you run the program, it displays two pairs of graphs—a full-screen and smaller—and prompts you to press a key to show a third pair at the bottom of the screen.

Initially, the value of bar I is 1, and the value of bar J is 8. Each time you press another key, the value of I increases by one until it reaches 16. (The value of J remains constant, but its corresponding bar becomes shorter when the value of I exceeds 8.)

The CHART subroutine uses a graphics "fill" character to create a bar graph display, automatically adjusting the length of the bar representing the largest quantity to full length. The other quantity is graphed in proportion to the first bar. The maximum length of the bar chart is 56 characters, producing a full display on an 80-character-by-25-line screen.

You may alter the bar graphs in a number of ways. To relocate the chart anywhere on screen, change the values of X% and Y%. (Make sure the chart fits correctly.) To change the title strings, assign a new title to STR1 and STR2. You may change the two integers you're comparing by altering the value of INT1 and INT2. For example, if you want to compare the number of Democratic versus Republican votes and place a full-screen bar in the upper-left corner of the screen, use this command:

```
CALL CHART("DEMOCRATS", "REPUBLICANS",
  DVOTES, RVOTES, 56, 1, 1);
```

BOX draws a box using a single-line border. It draws the upper-left corner first, then uses QBasic's STRING\$ function to extend a line to the right and draw the upper-right corner. A FOR loop then draws the left side, the open space in the middle, and the right side. The box is fin-

ished by drawing the bottom the same way as the top. Alter the location and size of a box by changing the values in the CALL BOX statement. The first two numbers [(1, 1) in the listing] are the screen coordinates of the box's upper-left corner; the second pair [(23, 80) here] tell the location of the lower-right corner.

*Douglas Park  
Biloxi, Miss.*

**The demonstration program BARDEMO.BAS shows how you might use the subroutines CHART and BOX to compare two numbers visually.**

```
DECLARE SUB BOX (Y1%, X1%, Y2%, X2%)
DECLARE SUB CHART (STR1$, STR2$, INT1%, INT2%, WID%, X%, Y%)

CALL BOX(1, 1, 23, 80)
CALL BOX(2, 2, 8, 79)
CALL CHART("STRING1", "STRING2", 1, 10, 54, 2, 2)
CALL BOX(9, 19, 15, 60)
CALL CHART("STRING1", "STRING2", 1, 2, 20, 19, 9)
LOCATE 23, 10: PRINT " Press a Key "
DO 'Pause for a keystroke
  KEY$ = INKEY$
  LOOP WHILE KEY$ = ""
  J% = 8
  FOR I% = 1 TO J% + 8
    CALL CHART("I : " + STR$(I%), "J : " + STR$(J%), I%, J%, 54, 2, 16)
  DO 'Pause for a keystroke
    KEY$ = INKEY$
    LOOP WHILE KEY$ = ""
  NEXT I%
END

SUB BOX (Y1%, X1%, Y2%, X2%)
  BOXWIDTH = X2% - X1% + 1
  LOCATE Y1%, X1%
  PRINT CHR$(218); STRING$(BOXWIDTH - 2, CHR$(196)); CHR$(191)
  FOR I = Y1% + 1 TO Y2% - 1
    LOCATE I, X1%
    PRINT CHR$(179); SPACES$(BOXWIDTH - 2); CHR$(179)
  NEXT I
  LOCATE Y2%, X1%
  PRINT CHR$(192); STRING$(BOXWIDTH - 2, CHR$(196)); CHR$(217)
END SUB

SUB CHART (STR1$, STR2$, NUM1%, NUM2%, WID%, X%, Y%)
  TEMPSTRING$ = ""
  IF WID% > 56 THEN WID% = 56 'Fit chart to 80 columns
```



## Think Big

I make my living programming microcontrollers—single-chip computers that control appliances, instruments, and toys. I use QBasic to write PC programs that supervise and test these gizmos during development. Because standard screen characters aren't legible from more than a few feet away, I've written subroutines that let me use my VGA monitor to display giant numbers.

The accompanying demonstration program, `BIG_LEDS.BAS` (page 62), puts my subroutines to work, displaying a four-digit value as it counts from zero to 9999. Modify the

listing to display important numbers in your life, such as the number of minutes until lunch, the number of shopping days until Christmas, or your share of the national debt.

The program works the same way as light-emitting-diode (LED) drivers. The seven segments of each LED, starting with the top bar and working clockwise around the display, are designated as A through G. The center segment is G. The number 8, for example, uses all seven segments:



```

IF NUM1% <= NUM2% THEN          'Determine largest number
    KEYNUM% = NUM2%
ELSE
    KEYNUM% = NUM1%
END IF
IF WID% < KEYNUM% THEN          'Adjust to fit display
    DO
        KEYNUM% = KEYNUM% \ 2: NUM1% = NUM1% \ 2: NUM2% = NUM2% \ 2
    LOOP WHILE WID% < KEYNUM%
END IF
BARLENGTH1 = (NUM1% * (WID% / KEYNUM%))
BARLENGTH2 = (NUM2% * (WID% / KEYNUM%))
LOCATE (Y% + 2), (X% + 4): PRINT STR1$ 'Write the first title
FOR I = 1 TO BARLENGTH1          'Draw the bar
    TEMPSTRING$ = TEMPSTRING$ + CHR$(178)
NEXT I
IF BARLENGTH1 < BARLENGTH2 THEN
    FOR I = BARLENGTH1 + 1 TO BARLENGTH2
        TEMPSTRING$ = TEMPSTRING$ + " "
    NEXT I
END IF
LOCATE (Y% + 2), (X% + 20): PRINT TEMPSTRING$
TEMPSTRING$ = ""
LOCATE (Y% + 4), (X% + 4): PRINT STR2$ 'Write the second title
FOR I = 1 TO BARLENGTH2          'Draw the bar
    TEMPSTRING$ = TEMPSTRING$ + CHR$(178)
NEXT I
IF BARLENGTH2 < BARLENGTH1 THEN
    FOR I = BARLENGTH2 + 1 TO BARLENGTH1
        TEMPSTRING$ = TEMPSTRING$ + " "
    NEXT I
END IF
LOCATE (Y% + 4), (X% + 20): PRINT TEMPSTRING$
END SUB

```

End

The subroutine `LED` turns each segment on or off according to the pattern of bits provided in the integer variable `SEGS%`. Another subroutine, `DISPLAY`, extracts the digits of the number you want to display, converts it to a bit pattern, and feeds it to `LED`.

The program's main loop uses a `FOR...NEXT` construction to count from zero to 9999. In the second line of the loop, the `DISPLAY (value)` construction tells QBasic which value to display. To make the program more useful, substitute the appropriate code in this section of the program.

You may also customize the listing by changing the values of the constants that set the color, size, and position of the LEDs. The constant `SCALE` controls the spacing of the LED numerals. Only four values are useful: 1 (small), 2 (medium), 3 (huge), and 4 (jumbo). As written, the program sets this value to 4. If you change that, you must adjust the `SN` value for constants `A$` through `G$`. If you set `SCALE` to 1, for instance, the line that sets the value of `A$` should read:

```

CONST A$ = "S1 B M+0,-242 B R4 E8
          R80 F8 G8 L80 H8 B R10"

```

`BIG_LEDS.BAS` displays numbers in red. If you prefer another color, experiment by changing the value of `LIT`. Values of 1 through 15 are permissible. The value of `UNLIT` controls the color of segments when they're not lit. As written, this value is set to zero, which is black (the same color as the screen).

To change the location in which the numbers are displayed, substitute new values for `XBASE` and `YBASE`. With a VGA display, permissible values for the former are zero through 6, and zero through 4 for the latter.

Scott Edwards  
Sierra Vista, Ariz.



The demo program **BIG\_LEDS.BAS** counts from zero to 9999; reusable subroutines display the count on a VGA screen in large numbers.

```

DECLARE SUB DISPLAY (THEVALUE%)
DECLARE SUB LED (XORIGIN%, YORIGIN%, SEGS%)
DEFINT A-Z
SCREEN 12: CLS

CONST SCALE = 4
CONST OFFSET = 35 * SCALE

'DECODE() holds the patterns of LEDs
'that form the digits zero to 9.
DIM SHARED DECODE(10) AS INTEGER

'These string constants hold instructions
'used by the DRAW command
'to draw the segments of the LED displays.
'The names A through G
'are consistent with the labeling
'for LED displays.
'
'Because QBasic allows simple math,
'but not string manipulation,
'in calculating CONST values,
'you must manually adjust the scale
'values to match that used
'in the constant SCALE, above.
CONST A$ = "S4 B M+0,-242 B R4 E8 R80 F8 G8 L80
           H8 B R10"
CONST B$ = "S4 B M+104,-123 H8 U100 E8 F8 D100 G8
           B U10"
CONST C$ = "S4 B M+104,0 H8 U100 E8 F8 D100 G8 B
           U10"
CONST D$ = "S4 B M+0,+4 B R4 E8 R80 F8 G8 L80 H8
           B R10"
CONST E$ = "S4 H8 U100 E8 F8 D100 G8 B U10"
CONST F$ = "S4 B M+0,-123 H8 U100 E8 F8 D100 G8 B
           U10"
CONST G$ = "S4 B M+0,-120 B R4 E8 R80 F8 G8 L80
           H8 B R10"

CONST LIT = 4           'Color of LEDs.
CONST UNLIT = 0         'Color of LEDs when off.
CONST XBASE = 60        'Position in pixels
                        'from left edge of screen.
CONST YBASE = 300       'Position in pixels
                        'from top of screen.

'Sets up the array DECODE()
'with the LED segment patterns for zero
'through 9.
FOR I = 0 TO 9: READ DECODE(I): NEXT I

'Main program loop.
'Substitute your own routines here.
FOR X = 0 TO 9999
    Display (X): SLEEP 1
NEXT X
END

'The data for the DECODE() array.
DATA 63, 6, 91, 79, 102, 109, 125, 7, 127, 111

```

```

'Given a value between zero and 9999,
'this subroutine prepares data
'that the LED subroutine needs
'to display the digits on the screen.
SUB DISPLAY (THEVALUE%)

```

```

    ONES = DECODE(THEVALUE MOD 10):
        THEVALUE = THEVALUE \ 10
    TENS = DECODE(THEVALUE MOD 10):
        THEVALUE = THEVALUE \ 10
    HUNDREDS = DECODE(THEVALUE MOD 10):
        THEVALUE = THEVALUE \ 10
    THOUSANDS = DECODE(THEVALUE MOD 10):
        THEVALUE = THEVALUE \ 10
    LED (XBASE + OFFSET * 3), (YBASE), (ONES)
    LED (XBASE + OFFSET * 2), (YBASE), (TENS)
    LED (XBASE + OFFSET), (YBASE), (HUNDREDS)
    LED (XBASE), (YBASE), (THOUSANDS)

```

END SUB

```

'Given an x,y position on the screen,
'and an integer representing the
'segments to turn on or off,
'this subroutine draws one LED digit
'on the screen. The integer SEGS%
'may be any value between zero and 127,
'but only the values supplied by DECODE()
'will look like actual numbers.
SUB LED (XORIGIN%, YORIGIN%, SEGS%)

```

```

    LITUP$ = STR$(LIT)
    DARK$ = STR$(UNLIT)
    LOCON$ = "B M" + STR$(XORIGIN%) + "," +
        STR$(YORIGIN%) + " C" + LITUP$
    LOCOFF$ = "B M" + STR$(XORIGIN%) + "," +
        STR$(YORIGIN%) + " C" + DARK$

```

```

    FILL$ = "P" + LITUP$ + "," + LITUP$
    BLANK$ = "P" + DARK$ + "," + DARK$

```

```

    IF SEGS% AND 1 THEN DRAW LOCON$ + A$ + FILL$
    ELSE DRAW LOCOFF$ + A$ + BLANK$
    IF SEGS% AND 2 THEN DRAW LOCON$ + B$ + FILL$
    ELSE DRAW LOCOFF$ + B$ + BLANK$
    IF SEGS% AND 4 THEN DRAW LOCON$ + C$ + FILL$
    ELSE DRAW LOCOFF$ + C$ + BLANK$
    IF SEGS% AND 8 THEN DRAW LOCON$ + D$ + FILL$
    ELSE DRAW LOCOFF$ + D$ + BLANK$
    IF SEGS% AND 16 THEN DRAW LOCON$ + E$ + FILL$
    ELSE DRAW LOCOFF$ + E$ + BLANK$
    IF SEGS% AND 32 THEN DRAW LOCON$ + F$ + FILL$
    ELSE DRAW LOCOFF$ + F$ + BLANK$
    IF SEGS% AND 64 THEN DRAW LOCON$ + G$ + FILL$
    ELSE DRAW LOCOFF$ + G$ + BLANK$

```

END SUB

End



## START-UP CLINIC

# Of Directories, Disks, And Destruction

by Jack Nimersheim

**Y**our problems are my problems, and lately your problems seem to have centered around disks and the files they contain. It's not surprising, really. Without disks and files, the only place you'd have for storing information would be memory, another topic of interest this month.

## Directory Assistance

*My directory is crowded with more than 50 files, and I don't know what all of them are. I've tried to call up the files and read them, without success, even when I use the File menu's View File Contents option in DOS-SHELL.EXE. Because I can't view all the files, I can't figure out which ones I need to keep.*

Anthony Mangiaracina  
Kendall Park, N.J.

Let me see if I can help, Anthony. In the printout you sent, fully half of the names in your main, or root, directory aren't the names of files at all; they're names of subdirectories, which were probably created when you installed programs on your system. When you view a directory in wide format (using DIR /W), you can easily identify subdirectory names, because they appear in brackets.

In the following directory listing, for example, note that the second and third entries actually refer to subdirectories:

```
COMMAND.COM
[JAZZ]
[WINDOWS]
```

(If you use a command such as DIR or DIR /P, subdirectory names are flagged with the identifier <DIR>.) Because subdirectories aren't normal files, DOS-SHELL doesn't let you view them.

With many of the files listed in your printout, the file's extension—the characters following the period—tells you something about the file. For example, the

extension BAT identifies a file as a batch file. Other identifying extensions include EXE and COM, for program files (like BAT files, they may be executed at the DOS prompt); SYS, for device-driver files; TIF, for a particular type of graphics file; DOC and TXT, for text files; and

HLP, for help files. Once you're familiar with these standard designations, it's relatively easy to figure out which files must remain in your root directory.

DOS's TYPE command and the View File Contents option in DOS-SHELL.EXE display only ASCII (text) files in a legible format. Other files appear in the indecipherable program or data code in which they're written. A file viewer, such as those in Central Point Software's PC Tools Pro and Symantec's Norton Desktop for Windows, can often detect a file's format and display it successfully, which will help you determine what type of file it is.

That said, let me offer a few words of advice on keeping your root directory as uncluttered as possible. It must include IO.SYS and MSDOS.SYS, the two hidden files DOS needs to boot successfully. (DOS automatically transfers these files to the root directory during installation, so you shouldn't have to worry about them.) Most people also leave COMMAND.COM in their root directories, because doing

*Often, a file's extension—  
the three characters after the  
period—serves as an important  
clue to the file's contents.*



so lets DOS find this critical file without adding a SHELL statement to CONFIG.SYS. The start-up files AUTOEXEC.BAT and CONFIG.SYS are also essential, so I recommend that you leave them in the root directory, as well.

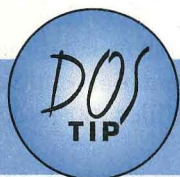
You should be able to move most of the remaining files to a different location. For instance, I store all my batch files (except for AUTOEXEC.BAT) in a directory named, logically enough, \BATCH. Adding C:\BATCH to the PATH statement in AUTOEXEC.BAT lets DOS find and execute a batch file, regardless of the directory in which I'm working at the time.

Device drivers are another type of file I like to remove from my root directory and put into C:\DEVICE. By default, DOS looks for device drivers and other executable files in the root directory dur-

ing start-up. If you move files such as these out of the root directory, you must include the appropriate PATH in the command you use to load a device driver into your CONFIG.SYS or AUTOEXEC.BAT. For example, if you move HIMEM.SYS (a DOS memory manager) to your device directory on drive C (C:\DEVICE), you must add this command to your CONFIG.SYS to load it into memory successfully:

```
DEVICE=C:\DEVICE\HIMEM.SYS
```

The best analogy I can think of to explain what adding a PATH accomplishes is a road sign. Including directory information in a command you call in CONFIG.SYS or AUTOEXEC.BAT helps DOS find its way to the file you want it to execute.



## A WATCHFUL EYE

If you work in an office and want to find out whether anyone uses your PC when you're away for the evening or the weekend, ACCESS.BAT and its companion program, CRLF.DAT, can help. Together, they keep an access log that records a date/time stamp each time your computer starts. Although ACCESS.BAT won't prevent unauthorized use of your PC, it does let you know when others have booted your computer.

To use the program, type in the following listing, using DOS's EDIT.COM or a word processor that saves files in ASCII (text) format:

```
ECHO — Computer Started — >> ACCESS.LOG
DATE < CRLF.DAT | FIND "Current date" >> ACCESS.LOG
TIME < CRLF.DAT | FIND "Current time" >> ACCESS.LOG
ATTRIB ACCESS.LOG +H
```

Save the program in the root directory of your start-up drive.

Next, you'll need to create CRLF.DAT, a small text file that echoes a carriage return and linefeed to DOS's TIME and DATE commands. ACCESS.BAT uses these commands to record the time and day automatically whenever your computer starts. To create CRLF.DAT, log onto the root directory of your boot drive, then type the following line:

```
COPY CON CRLF.DAT
```

To add a carriage return and linefeed to the file, press Enter; press F6 and Enter to end the file.

For ACCESS.BAT to execute at startup, you must edit your AUTOEXEC.BAT, adding a line that reads ACCESS. Finally, check to make sure the directory housing FIND.EXE is listed in your AUTOEXEC.BAT's PATH statement. ACCESS.BAT won't work unless it can find this program.

To prevent snoopers from realizing that you're "watching," ACCESS.BAT designates its log file, ACCESS.LOG, as hidden, which means the file doesn't show up when you type DIR to view the contents of the root directory. You can see the log file's contents, however, simply by typing the following line:

```
TYPE ACCESS.LOG | MORE
```

—John Wolfskill

## Disk Diagnosis

*I'm responsible for several PCs to which library patrons have access. Unfortunately, many people who want to use our computers have no idea on which type of machine their disks were formatted. Can you suggest a Debug or a public-domain program that will let me determine whether a disk was formatted on a machine other than a PC compatible? Also, how can I tell the density at which an unformatted disk should be formatted?*

*John M. Huber  
Milwaukee, Wisc.*

I don't know of a program that determines whether a disk was formatted on a PC compatible, but you don't need one.

DOS doesn't recognize any disk format other than its own, so you can usually tell whether a disk containing data is a DOS disk by trying to read it. (Don't worry; you can't physically harm a "foreign" disk by attempting to read it in a PC compatible.)

For example, if you insert the disk into drive A, type DIR, and get a "Not ready reading drive A. Abort, Retry, Fail?" message, either the disk isn't a PC disk or it's damaged.

Unfortunately, if DOS won't let you access a disk, you can't use a DOS-based utility to determine the type of system on which that disk was formatted. DOS prevents most



utilities from reading the disk and, therefore, analyzing its structure.

To answer your second question, you can usually determine the density of a disk by looking at it. This identification method works best with a 3.5-inch disk. If the disk has a single square hole located to the right of the disk label, it's a 720K disk. If it contains two square holes, one on either side of the label, you should format it to 1.44MB capacity.

Identification is trickier with 5.25-inch disks. As a rule, however, low-density (360K) disks include a protective plastic ring around the center hole. Disks lacking this ring are usually high-density disks, which can hold 1.2MB of data.

## Fear of Windows

*My stepdaughter, a computer programmer, just informed me that running DOS programs under Windows can destroy a hard disk. She also said that Windows data could destroy my hard disk. By destroy she meant do irreparable harm that would force me to buy a new hard drive. She got this information from another computer programmer, who has ten years of experience. Is she right?*

Mary Ann Brown Diaz  
Odessa, Fla.

It sounds to me as though someone's crying wolf. I'm not going to say that a hard disk has never failed when running a DOS program under Windows. For one thing, I never say *never*.

Second, almost as many Windows-related horror stories are floating around out there as there are copies of Windows installed on computers. To my knowledge, however, Windows can't destroy a hard disk beyond repair.

What's more likely to happen is that if you end a Windows session improperly—for example, by turning off your computer without closing the applications running under Windows—you may corrupt your file-allocation table (FAT) and thus destroy the pointers DOS relies on to find all the information a file should contain. That's why you see the following warning if you try to end a Windows session while programs are running in a DOS window:

Application still active.  
Quit the application before quitting Windows.

In fairness to Windows, you can corrupt data files by exiting improperly from many standard DOS applications, as well.

It's also possible that your stepdaughter was talking about the problems that can befall you if you run certain disk analyzers under Windows, including DOS's own SCANDISK.EXE, CHKDSK.EXE, and DEFRAG-

.EXE, as well as third-party programs such as Gibson Research's SpinRite. You should never run programs of this type within Windows, and, as a rule, Windows warns you if you try to do so. Ignoring the warning may scramble your data, but, to my knowledge, it won't physically harm the disk.

## Fill in the Blanks

*After installing Qualitas's 386MAX 7 on my 386SX computer, I used its MAXIMIZE command to optimize my system's memory. When I wanted to see exactly how much memory each program used, I used DOS's MEM /C command. But several entries in the Name column contained hyphens or were blank. How can I tell which programs occupy the unnamed areas? I tried DOS's diagnostic utility, MSD.EXE, and The Norton Utilities with no luck.*

Frederick L. Speir  
Fort Drum, N.Y.

From the printout for MEM /C you supplied, I can see that some of the high-memory areas are small chunks of RAM that 386MAX uses to manage high memory. Other areas, however, occupy a large enough segment of RAM that they must be programs—perhaps device drivers or memory-resident programs.

You can't blame DOS for not naming each program in high memory; the unnamed program itself is at fault. As a rule, software developers insert a "signature" into each program's code, a fragment DOS and other utilities use to identify it. If the signature is missing, MEM has no way of knowing the name of the program occupying a specific section of RAM. Often, however, a little detective work will help solve the mystery.

First, print your CONFIG.SYS and AUTOEXEC.BAT files; then compare those printouts to the one for MEM /C. Cross out the commands in AUTOEXEC.BAT and CONFIG.SYS that correspond to a program named in the MEM /C printout. For example, if CONFIG.SYS contains a DEVICEHIGH = MOUSE.SYS command and MEM /C lists a program called MOUSE.SYS, cross out the DEVICEHIGH line. Programs that load into high memory at start-up and aren't crossed out when you finish this exercise are the ones MEM can't identify.

You didn't include a copy of your CONFIG.SYS and AUTOEXEC.BAT files, but, judging from the amount of memory the unnamed programs use—42K and 84K—my guess is that you have a multimedia system and that the unidentified files are the device drivers for your CD-ROM and sound card. ■

*Jack Nimersheim has been writing about computers for 14 years. He's the author of two dozen books on computer-related topics. His newest book, Slick Tricks: DOS 6.2 (Random House Electronic Publishing), was released last April.*



## DOS WORLD

# Q&A

### DOS

**Q** I can't switch to, rename, or remove a directory entry I created on my hard disk.

Each time that I try to access the directory, MS-DOS 6.22 gives me an "Invalid directory" message. When I try to use DOS's CHKDSK utility to find the problem, CHKDSK hangs after reading the directory entry. DOS's ScanDisk [SCANDISK.EXE] utility doesn't find any errors when it reads the directory entry, however. How can I remove this directory from my hard drive?

**A** You seem to have a cyclic cross-link in your directory structure. Such cross-links occur when two file entries (DOS treats directory entries as files) in the file-allocation table (FAT) refer to each other. This effectively causes DOS to chase its tail when it tries to read directory information. Under normal circumstances, ScanDisk doesn't recognize cyclic cross-links, but it will repair other types of FAT cross-links. CHKDSK probably isn't hanging up, but instead is attempting to read the cross-linked directory information.

First, I suggest that you edit your SCANDISK.INI file, which on most systems resides in the C:\DOS directory. Change the NUMPASSES line to read as follows:

```
NUMPASSES = 8
```

This makes ScanDisk run more slowly, which may let it recognize the error. If ScanDisk still doesn't recognize the problem, you'll need a

third-party utility to do the job. One such program is Disk Doctor, included in The Norton Utilities 8.0 (Symantec, 800-441-7234 or 408-253-9600; \$179).

**Q** Whenever I try to use one of my database manager's database files, I get an "Access denied" message. What might be causing this?

**A** DOS issues the message you mention under several circumstances. Sometimes it happens when a database file you're trying to access is designated as system, hidden, or read only. These attributes protect a file from being modified.

To find out whether that's the source of your difficulty, change to the directory that holds your database file, and type the following command:

```
DIR /AHRS
```

DOS will list all files in the current directory for which a system, read-only, or hidden attribute is set. If your database file is among those listed, change the offending attribute.

For example, if you discover that the file is designated as read only, type this DOS command:

```
ATTRIB filename -R
```

You can turn off more than one attribute at a time. This command, for example, turns off the read-only, hidden, and system attributes:

```
ATTRIB filename -RHS
```

DOS may also display an "Access denied" message if you load SHARE.EXE from your AUTOEXEC.BAT file. SHARE is commonly used to provide file- and record-locking services for networking and Windows users, preventing two or more users or programs from updating the same data file simultaneously. When SHARE is on the job, DOS displays an "Access denied" message whenever you attempt to update a data file it thinks is in use.

DOS also issues this error message when an insufficient number of locks are available to support the current application or the current number of network users. The number of locks determines the maximum number of files you may protect. By default, SHARE allocates 20 locks. To increase this number, add a /L:xx switch to the SHARE command, where xx is the number of locks you want to establish. This command, for instance, provides 30 locks:

```
SHARE /L:30
```

If you want 30 locks available each time you boot your system, add this line to your CONFIG.SYS file:

```
INSTALL = SHARE /L:30
```

**Q** I want to add an XCOPY command to my AUTOEXEC.BAT file so that when I exit Windows 3.1 at the end of the day, I can automatically back up new or modified files to my C:\BACKUP directory. Usually, I start Windows from a command in my AUTOEXEC.BAT file, and I want the new command to activate XCOPY immedi-



ately after I quit Windows. I think the right command might look something like this:

```
XCOPY *.* /S /D:(today's date)
C:\BACKUP
```

Unfortunately, however, I don't know how to supply today's date to XCOPY's date switch (/D:).

**A** You can't accomplish the task at hand in a single command, but you can get the job done by calling my batch file, WINDAY.BAT (shown at right), from your AUTOEXEC.BAT file. The correct command is as follows:

```
CALL WINDAY.BAT
```

The program uses several tricks to store the current date in an environment variable named THEDATE. It starts by calling Windows; when you quit Windows, the program clears the variable THEDATE as a safety precaution, and creates a batch file called TODAY123.BAT. Next, the program lists the new batch file's directory entry, using the DIR command. The command switches used with DIR tell DOS to override any switches you may have specified in the environment variable DIRCMD. (In MS-DOS 5 and later, you may add SET DIRCMD= to your CONFIG.SYS file to tell DOS how you want directory listings to appear when you type DIR.)

The text from the resulting directory entry is piped (|) to the FIND command, which looks for a line containing the text strings TODAY123 and BAT. When FIND locates a match, such as this line:

```
TODAY123 BAT 160 12-24-94 3:21p
```

it uses the greater-than (>) redirection symbol to write the line to another temporary batch file, GETDATE.BAT. The next line calls GET-

**WINDAY.BAT makes it easy to store backup copies of files you modify or create during a computing session. As written, the program springs into action after you exit Windows. To modify it to run after you quit another program, simply substitute the appropriate PATH for C:\WINDOWS in the first line of the program and replace WIN in the second line with the name of the program you want to run.**

```
CD C:\WINDOWS
WIN
@ECHO OFF
SET THEDATE=
ECHO SET THEDATE=%*3 > TODAY123.BAT
REM The following two lines constitute a single program line.
DIR TODAY123.BAT /-O /-L /-W /-B /-P | FIND "TODAY123 BAT" >
    GETDATE.BAT
CALL GETDATE
DEL TODAY123.BAT
DEL GETDATE.BAT
ECHO ** Updating modified files for %THEDATE% **
XCOPY *.* /S /D:%THEDATE% C:\BACKUP
CD C:\
```

End

DATE.BAT. Although the single line of text that WINDAY.BAT places into GETDATE.BAT is part of a directory listing, DOS evaluates the line as a valid DOS command, gleaning from it the current date, the parameter %3.

In the directory-entry line above, for example, DOS treats TODAY123 as the command, which it designates as %0. BAT is the first parameter (%1), 160 is the second parameter (%2), and 12-24-94 is the third parameter (%3). So the value 12-24-94, the date on which TODAY123.BAT was created, is assigned to the DOS environment variable THEDATE. (Note that in WINDAY.BAT, the third parameter has two percent signs: %%3. This indicates that the system will use the parameter within a batch file, instead of at the DOS prompt. The first percent sign is deleted automatically as the line is redirected.)

The two DEL commands following the CALL statement erase the temporary batch files. With this cleanup chore complete, WINDAY.BAT informs you that it's about to back up new or modified files. Then it executes an XCOPY command, which

uses the /S switch to back up all files in the root and its subdirectories whose dates (/D:) match the current date.

## HARDWARE

**Q** Can you execute DOS commands when two computers are connected via DOS's file-transfer utility, InterLink [INTERLNK.EXE]? Because my laptop doesn't have a floppy drive, I recently tried to install DOS 6.22 remotely on my laptop computer, using InterLink to send files from my desktop PC to the laptop through the machines' parallel ports. Unfortunately, near the end of the process, I received an unrecoverable disk-write error, and now I can't boot my laptop's hard drive. Each time I try to use the SYS or FORMAT command to correct the problem, DOS returns an error message. What should I do next?

**A** I suggest you purchase a floppy drive for your laptop PC, install it, then install your new DOS version from floppy disks. Because InterLink treats all drives as network drives, you can't



execute DOS commands such as SYS and FORMAT while it's active. (If DOS let you use such commands on a network drive, you might inadvertently interfere with the operation of the network server or destroy data.) For more information on DOS's file-transfer utility, see "Sharing Resources with InterLink," page 23 in this issue.

**Q** I installed a new motherboard in my computer, but retained my existing 100MB Conner hard drive. I correctly set the CMOS setup program parameters for the drive, then rebooted the system. The computer reads my CONFIG.SYS file, but DOS then issues a "Bad or missing COMMAND.COM" error message, and the system locks up. When I insert a bootable start-up floppy disk into drive A, the computer starts properly. It even lets me use the programs stored on drive D. Whenever I attempt to access drive C, however, DOS displays an "Error reading drive C:" message. What's wrong?

**A** DOS has failed to properly read its system start-up files, which normally reside in the boot sector (usually sector zero) of your hard disk. Either the start-up files are damaged or missing or your hard drive isn't positioning its read/write head properly over the correct area.

First, try transferring the system start-up files to your hard disk. Restart your PC with your emergency boot floppy in drive A, then type SYS C:. You should receive a "System transferred" message. If so, remove the start-up floppy disk from drive A and restart your PC by pressing the key combination Ctrl+Alt+Del.

If this procedure doesn't cure the problem, recheck the CMOS setup parameters for your hard drive to ensure that you've entered them properly. These parameters, which include the number of heads and data cylinders for your particular hard drive, are usually listed in the manual included with your hard drive or are printed on a small

white tag glued to the top of your hard drive.

Take a close look at the hard-drive settings you've typed into the CMOS setup tables. If the setting for CYL (cylinders) or WPC (write pre-compensation code) is entered incorrectly, your hard drive won't be able to find the data sectors that hold DOS's start-up files. If your hard drive doesn't have this information, your PC won't boot properly.

## UTILITIES

**Q** Do you know of a program that will let me browse through large text files and view data records containing as many as 500 characters on a single screen line? I'm looking for a program similar to the DOS text editor, Edit [EDIT.COM]. I can't use Edit because it displays an "Out of Memory" message when I try to load a large text file. Can you suggest a program that might work?

**A** Edit lets you work only with files that are small enough to fit into conventional memory (640K minus the space required by the program). The only DOS-based text editor I know of that may fulfill all your needs is Brief, a versatile program from Borland (\$249.95, \$99.95 for Borland customers; 800-331-0877 or 408-461-9000). Although Brief is primarily intended as a programmer's editor, it's easy to use. Equally important, it can handle a text file of unlimited size and also lets you display lines of text containing as many as 512 characters.

You might also check out SemWare's excellent program QEdit Advanced (\$59; 404-641-9002, 800-467-3692), discussed in this issue's "Shareware Exchange," page 88. ■

*"Q&A" is compiled by Technical Editor John Wolfskill. He's the president of Powertrain Development, a software-design company based in New Hampshire.*



## ROOM WITH A (BETTER) VIEW

When you're doing file management, it's often easier to work in Windows' File Manager than at the DOS prompt. You can delete a raft of files by pointing and clicking instead of trying to figure out wildcard sequences. But when you're dealing with long directory listings, File Manager's directory window can seem pretty cramped. Scrolling around to look for files is a nuisance.

Fortunately, there are couple of quick ways to show more files in the window. First, click on the directory window's Maximize button, the up arrow in the window's upper-right corner. If that doesn't give you enough space, click on the Maximize button in File Manager's upper-right corner. This expands File Manager to occupy the entire screen. To display even more files in the window, open the Options menu and click on Font. Instead of 10-point Helvetica or Times, you're going to try using something smaller.

Scroll through the list of fonts and click on the one called Small Fonts. In the list box labeled Size, make sure the option for 7-point type is highlighted. (Unless you have eagle eyes, anything smaller may be difficult to read.) In the box labeled Font Style, highlight Regular. Press Enter or click on OK.

If you're still not satisfied, try playing with the font style and size settings until you get something you like. Of course, at this point you may want to abandon the idea of displaying directory listings in small fonts and make a more dramatic statement by displaying the directory in 14-point bold type.

—Lenny Bailes



WINDOWS SEAT

# A SMARTMON For Cool Runnings

by Doug Lowe

**B**undled inside every copy of MS-DOS version 6.x is SmartDrive, a valuable disk-caching utility that can significantly boost your computer's hard-drive performance. The trade-off, however, is that it works at the expense of valuable RAM that your application programs could put to good use. The tough question, then, is this: How much of your precious RAM can you safely dole out and still benefit from SmartDrive?

Configuring SmartDrive properly is a balancing act. The greater the amount of memory dedicated to SmartDrive, the bigger the number of records it can hold in its RAM cache. At the same time, increasing cache size reduces the amount of memory available for other uses. Not allocating enough memory to SmartDrive stifles its ability to improve disk performance—but allocating too much wastes memory without improving performance significantly.

Let's say your computer is equipped with a modest 4MB of RAM. One megabyte is set aside for conventional and upper memory, leaving 3MB of extended memory. On this particular computer, for example, SmartDrive will create by default a 1MB cache, which shrinks to 512K when Windows runs. Knowing that, should you allocate half your memory to SmartDrive? 1MB? 512K? How do you know how much memory is enough?

No book or magazine article can give you a sure-fire answer, because the proper amount of SmartDrive memory depends on many factors, such as the amount of memory available on your computer and the types of programs you use. The only way to tune Smart-

Drive for optimum performance is to monitor it, adjust its configuration, and note the results.

If you have MS-DOS 6.0 or later, you can monitor SmartDrive easily by calling up SMARTMON, a Windows program hidden in your \DOS directory.

MS-DOS installs this bonus utility on your hard disk, but doesn't tell you about it. It's not mentioned in the on-line Help, nor is it installed automatically into the Microsoft Tools group with the Windows versions of Microsoft Backup, AntiVirus, and Undelete. (Because SMARTMON is a Windows program, you can use it only when running Windows.)

*Keep track of SmartDrive's  
disk-caching performance with  
this little-known Windows program.*

## "MON" at Work

To get SMARTMON going, select the Run command from Program Manager's File menu, type C:\DOS\SMARTMON

## ATTENTION Windows Users

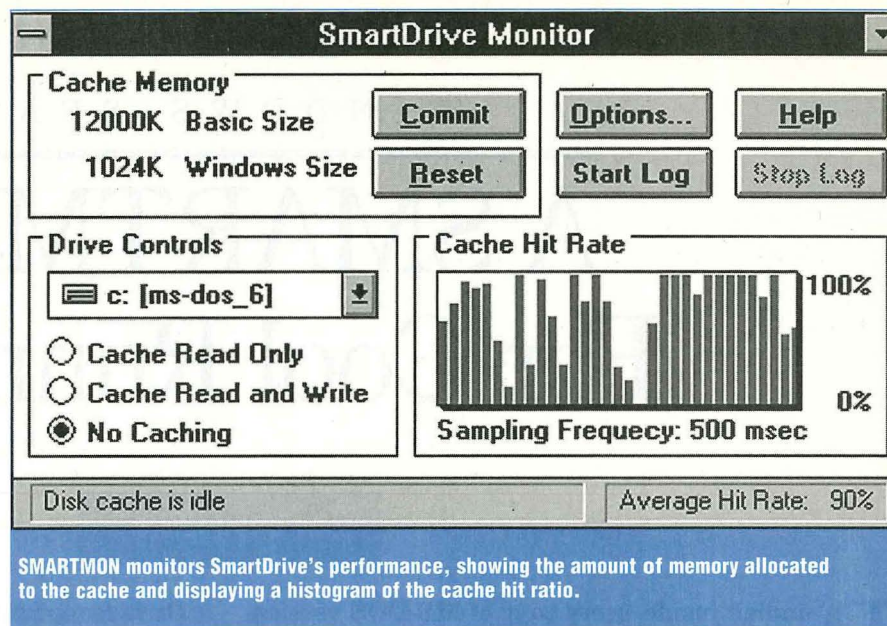
*If you use Windows regularly, you probably know a few tricks yourself. Or perhaps you've found a better way to do the job described here. This column is your chance to share your techniques with other Windows users. Contact the Windows Editor at DOS World, 80 Elm St., P.O. Box 802, Peterborough, NH 03458-0802, or on CompuServe (75300,2357) or MCI Mail (667-4854).*



in the Program field, and click on OK. SMARTMON will come to life as shown in the accompanying screen shot (right). If you decide you like SMARTMON, consider adding an icon for it to your Microsoft Tools or Accessories program group.

As the screen shot shows, SMARTMON's window is chock-full of information about SmartDrive. One of the most revealing items is the histogram chart detailing the "hit ratio": the percentage of requests to read disk data that your system retrieves from cache memory rather than from the disk itself. The higher the hit ratio, the more SmartDrive is boosting your computer's performance.

Each bar in the histogram represents one half-second interval. If you let your system run awhile and monitor this chart periodically, you'll develop an idea of how effective your SmartDrive cache is. If you consistently see cache hit rates of 50 percent or better, SmartDrive



is doing a good job. If rates are low, you may need to allocate more memory to SmartDrive's cache.

SMARTMON also shows the amount of memory SmartDrive is currently using, and the caching status for

each of your disk drives (cache reads only, cache reads and writes, or no caching). You can change the caching status for a particular drive by playing with these controls.

### Buttons Galore

The six buttons in the SMARTMON window provide the following handy functions:

- **Commit.** Forces your system to immediately write to disk any data currently held in SmartDrive's write cache. Since SmartDrive never lets disk data stagnate in the write cache longer than five seconds and writes cache data to disk automatically whenever you exit Windows, don't feel you have to use this button for safety purposes.
- **Reset.** Flushes all data from SmartDrive's cache memory and resets the histogram.
- **Options.** Lets you set various SMARTMON selections, as described below under "Exercising Your Options."
- **Start Log.** Begins recording SmartDrive hit rates in a disk file named SMARTMON.LOG, located in your \DOS directory. This is useful only if you need to monitor SmartDrive's performance over a long period of time.

DOS  
TIP

## KICKING COMMAND.COM UPSTAIRS

If your PATH statement is humongous, if you call several SET statements in your CONFIG.SYS file, or if you set aside a sizable chunk of space for the environment, you can free up conventional memory by loading the environment into an upper-memory block.

The procedure is simple. First, add the following command at the end of your CONFIG.SYS file:

```
SHELL=C:\COMMAND.COM /P
```

The SHELL command tells DOS which program to use as its command interpreter. COMMAND.COM's /P switch tells DOS to make this copy of COMMAND.COM permanent, which prevents you from accidentally crashing your system if you type EXIT at the DOS prompt.

Then place this command anywhere in your AUTOEXEC.BAT:

```
LH C:\COMMAND.COM /E:xxxx
```

where xxxx is the number of bytes you want to reserve.

When you take this approach, DOS loads an additional 2.8K command kernel into conventional memory. Consequently, this technique saves conventional memory only if you need to reserve at least 2048 bytes of space for the environment. Of course, for DOS to load any program high, you must be using version 5 or later.

—Lenny Bailes



- **Help.** Displays hints and tips for using SMARTMON.
- **Stop Log.** Stops recording the log file.

If you minimize the SMARTMON window, you may notice that it stays visible, even if you're using another application. To change that, click on SMARTMON's control box in the upper-left corner of its window, then click on the "Always on top" menu command.

### Exercising Your Options

To set a variety of functions, click on SMARTMON's Options button, which calls up a dialog box.

Two options control the way SMARTMON collects and displays data on SmartDrive's cache hit rate. Sampling Frequency indicates how often SMARTMON checks SmartDrive's hit rate; the default is every 500 milliseconds, or once every half second. The Histogram Display Intervals option sets the number of samples.

Two additional options affect SMARTMON's log file: File Name lets you change the name in case you don't like the default SMARTMON.LOG; Automatic Stop tells SMARTMON to cease logging cache data after a specified period of time. (The default is two hours.) Automatic Stop prevents the log file from growing indefinitely; even with a two-hour maximum, it can still get pretty big—well over 20MB.

Two final options let you update the SMARTDRV command in your AUTOEXEC.BAT file to reflect any changes you've made in drive-caching options. Just check the Save Settings box, then type the name of the batch file in the File Name field. (The default is AUTOEXEC.BAT, but if your SMARTDRV command is in a different batch file, you can change this field accordingly.)

### Monitoring SmartDrive from DOS

If Windows gives you the willies, you can obtain some of the infor-

mation SMARTMON provides by typing the command SMARTDRV /S from the DOS prompt. The /S switch tells SMARTDRV to display status information, including data on SmartDrive's cache hits and misses.

The SMARTDRV /S command will produce a screenful or more of output. The lines in which we're interested look something like this:

There have been 282,096 cache hits  
and 44,628 cache misses.

These totals indicate the number of cache hits and misses since SmartDrive started. To determine the hit ratio, add the number of

hits to the number of misses for the total number of disk accesses. Next, divide the total into the number of cache hits. In the example above, the hit ratio is 86 percent.

If you see Windows as a valuable computing tool, however, give SMARTMON a try. Anything that helps you boost your system's performance—and bridge the gap between DOS and Windows—has got to be one cool program. ■

*Contributing Editor Doug Lowe is the author of 15 computer books, including The Only DOS Book You'll Ever Need (Murach) and The Microsoft Press Guide to DoubleSpace (Microsoft Press).*



## ALL THE PAGES FIT TO PRINT

Some programs, particularly older ones, aren't designed to work properly with modern laser printers; they leave the last page of output stuck in the printer. Usually, you can print this page by pressing the printer's form-feed button, but you can simplify things by creating a program that tells the printer to cough up the page. First, use the DOS editor Edit (or another editor that saves files in text format) to create a Debug script named FF.SCR. Don't forget to leave a blank line between INT 21 and R CX. Next, issue this command to create a small program named FF.COM:

```
DEBUG < FF.SCR
```

To force your laser printer to spit out the final page of a document, simply type FF at the DOS prompt. Note that you can achieve a similar effect by creating a batch file that uses an ECHO command to echo a form-feed character to the printer. Unfortunately, however, the ECHO command echoes a carriage-return/line-feed combination, so printing begins on the second line of the next page.

—Doug Lowe

**Use the Debug script FF.SCR to create the executable program FF.COM, which sends a form feed to your printer.**

```
A 100
MOV AH,5
MOV DL,0C
INT 21
MOV AL,0
MOV AH,4C
INT 21
```

```
R CX
12
N FF.COM
W
Q
```

End



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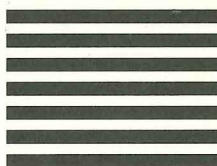
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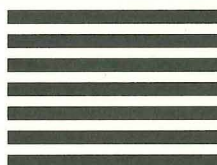
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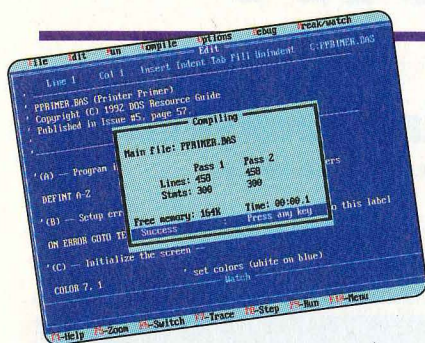
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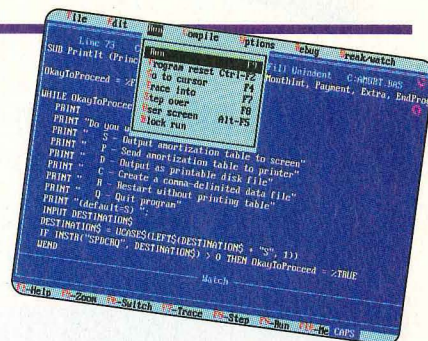
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From the Editors of *DOS WORLD*!



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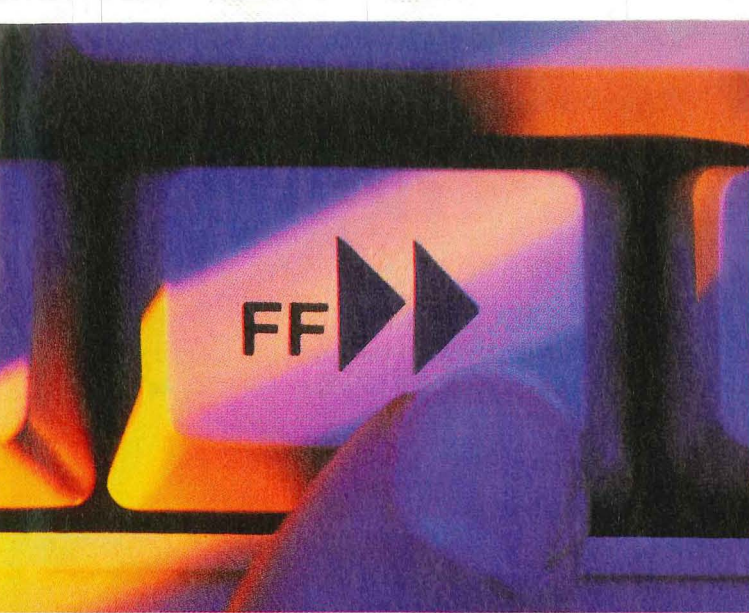
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## REPLACEABLE TEXT

Articles in *DOS World* will often give you a command that includes text you must replace with your own information. This replaceable text is in *italics*. For example, in the following command, you'd replace *filename* with the name of your own file:

```
COPY A:filename B:filename
```

## THE CONFIG.SYS FILE

You also have a file in your root directory called CONFIG.SYS. Like AUTOEXEC.BAT, this file is in ASCII, and you can view your CONFIG.SYS file with the TYPE command. A typical CONFIG.SYS might look like this:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
FILES=50
BUFFERS=10
SHELL=C:\DOS\COMMAND.COM
C:\DOS\ /E:1024 /P
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\SETVER.EXE
```

The rules for handling CONFIG.SYS are the same as they are for AUTOEXEC.BAT: Always back up the original file before you modify it and always have an emergency boot disk available. As with AUTOEXEC.BAT, changes you make to CONFIG.SYS won't take effect until you restart your computer.

## ANSI.SYS AND THE ESCAPE CHARACTER

When an article says you must have ANSI.SYS installed, it means that the MS-DOS file ANSI.SYS should be in your DOS directory, and the following line should be in your CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

Some articles that discuss ANSI.SYS will also ask you to create a batch file that uses the escape character. Unfortunately, there's no uniform method of doing so. If you use EDIT, the text editor that comes with MS-DOS, you can make an escape character by pressing Ctrl+P and then the Esc key. The escape character appears on screen as a small left-pointing arrow. If you're using another text editor or word processor, check its instructions for information on how to enter the escape character.

# How to Use

## THE AUTOEXEC.BAT FILE

Most people have a batch file called AUTOEXEC.BAT on their hard disk. If you want to look at it, first go to your root directory by typing CD\ . Type DIR to make sure AUTOEXEC.BAT is there. Then type the following command:

```
TYPE AUTOEXEC.BAT | MORE
```

A simple AUTOEXEC.BAT file might look like this:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS;C:\WP51;C:\BAT
C:\DOS\SMARTDRV.EXE
C:\MOUSE\MOUSE.COM
C:\DOS\DOSKEY.COM
SET TEMP=C:\TEMP
```

When a *DOS World* article instructs you to modify your AUTOEXEC.BAT file, always make a backup copy of the original AUTOEXEC.BAT first. The most common names for your backup copy are AUTOEXEC.BAK or AUTOEXEC.BK. The latter lets you save different versions of your backups—for example, AUTOEXEC.BK1 and AUTOEXEC.BK2. You create a backup copy with the following command:

```
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

Also, you should have an emergency boot disk available whenever you modify AUTOEXEC.BAT. (See the accompanying section on the facing page, top.) It will let you access your hard drive in case you make an error that locks up your computer. Changes you make to AUTOEXEC.BAT won't take effect until you restart your computer.

## BATCH FILES

A batch file is a text file that tells MS-DOS to do a series of tasks. The filename of a batch file always ends with the extension .BAT.

A batch file must be in plain-text format. For example, a batch file might consist of the following lines:

```
CD\
DIR /S /P
```

This batch file moves you to the root directory (CD\ ) and then gives you a list of all files in all directories (/S), pausing after each full screen (/P).

Every batch file needs a name. In such cases, you should pick your own name. Batch-file names carry the same limitations as any other DOS filename; you're limited to eight characters, plus a three-character extension. A batch-file name must always use the .BAT extension.

To avoid confusion and unexpected results, don't give any batch file the same name as another program or DOS command. For example, VCOPY.BAT is an acceptable name for a batch file, but not COPY.BAT or XCOPY.BAT, because COPY and

XCOPY are the names of DOS commands. To run or execute a batch file, type its name at the DOS prompt. For example, to run a batch file called VCOPY.BAT, type VCOPY at the DOS prompt.

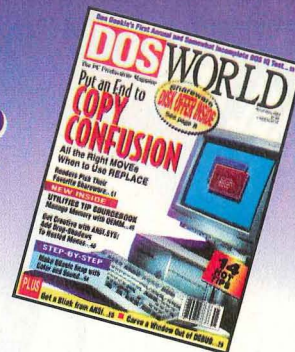
### Creating and Saving

**Using EDIT.** If you have DOS 5 or later, you can create a batch file using EDIT. EDIT usually resides in your DOS directory. Type EDIT and enter your batch file. When you're done, press Alt+F and choose the Save option. Type the name of your batch file (make sure you add the extension .BAT) and press the Enter key.

**Using other word processors.** Most word processors don't save files in plain text; they include other characters, such as control characters that handle such matters as page formatting and typefaces. Most word processors, however, do give you an option to save in plain text. The procedure varies from one word processor to the next. For example, when you save a file in WordPerfect 5.1, you choose ASCII Text (DOS) as your Format option.



# This Magazine



## MAKING AN EMERGENCY BOOT DISK

Sometimes a *DOS World* article will suggest that you create a *bootable floppy*—a floppy disk that serves as an emergency system disk. That is, if your computer for some reason can't access your hard drive, you can start your computer from the emergency floppy. You should always have an emergency system disk available, but it's particularly important when you modify *AUTOEXEC.BAT* or *CONFIG.SYS* because you may change those files in such a way that your computer won't start from the hard drive. To create a system disk:

1. Insert a floppy disk in drive A.
2. At the command line, type **FORMAT A: /S** (all existing information on the floppy will be lost).

DOS first formats the floppy disk. Then it copies three DOS system files to the floppy disk: *IO.SYS*, *MSDOS.SYS*, and *COMMAND.COM*.

The first two are hidden files; you won't see them if you type **DIR A:**. If you have the disk-compression program Double-Space on your computer, the **FORMAT** command above will also copy *DBLSPACE.BIN*, a third hidden file, to the floppy disk.

After you've created your system disk, you should copy a few other basic files to your floppy.

Go to your DOS directory and copy the following files: *FORMAT.COM*, *EDIT.COM*, *EDIT.HLP*, *QBasic.EXE*, *UNDELETE.EXE*, *CHKDSK.EXE*, and *FDISK.EXE*.

## DEBUG SCRIPTS

A Debug script is a list of assembly-language instructions you convert to an executable program using the Debug program in your DOS directory.

**Creating the script.** A Debug script must be in plain text. The procedure for creating the script is the same as for creating a batch file. You can use DOS's *EDIT* program, or you can use a different text editor or word processor and save the script in plain text format.

**Creating an executable program.** After creating and saving the script, type the following command at the DOS prompt:

```
DEBUG < filename
```

where *filename* is the name of the Debug

script you created. For example, if the name of your Debug script is *KEYPRESS.SCR*, you'd type this line:

```
DEBUG < KEYPRESS.SCR
```

at the DOS prompt. The executable program created by Debug will have the extension *.COM*. The name of the executable file is determined by the contents of the script. Our convention is to use the same name for the executable file as we do for the script. Thus, the executable file created by *KEYPRESS.SCR* will be named *KEYPRESS.COM*. Once you've created the executable file, you run it by typing its name at the DOS prompt. To run *KEYPRESS.COM*, type *KEYPRESS*.

## PATHS AND THE PATH STATEMENT

*DOS World* articles often tell you to make sure that a particular file is in a directory included in your *PATH* statement. This lets you run a *.COM*, *.EXE*, or *.BAT* file from any directory on any drive.

For example, an author might tell you to create a batch file called *TEST.BAT*, put it into a subdirectory called *\BAT*, and put the subdirectory into your *PATH* statement. You can then execute *TEST.BAT* by typing *TEST* from anywhere on your drives, without having to change to the *\BAT* directory first.

The *PATH* statement is a line in your *AUTOEXEC.BAT* file. It gives DOS a list of directories to search for requested files. Here's an example:

```
PATH=C:\DOS;C:\WINDOWS;C:\BAT
```

When you type *TEST* at the DOS prompt, DOS looks for the program first in the current directory, then in the root directory, and then, in order, the *\DOS*, *\WINDOWS*, and *\BAT* directories. When it finds *TEST.BAT* in the *\BAT* directory, it executes the batch file.

*Continued on page 79*

## BASIC DEFINITIONS

**DOS prompt.** Also known as the *command prompt*. By default, the DOS prompt looks like this: *C:\>*. This is where you type the instructions to run programs or DOS commands.

**Boot, boot up, reboot.** The process of starting or restarting your computer. Turning on your computer is *booting* or *booting up*. Pressing the key combination *Ctrl+Alt+Del* restarts, or *reboots* your computer. So does pressing the reset button, if your computer has one.

**Extensions.** When we refer to a program by its common name (for example, the DOS command *FORMAT*) without an extension, you can assume that the extension is *.COM* or *.EXE*. When we refer to a batch file, we always include the extension *.BAT*. QBasic program names must always include the *.BAS* extension.

**ASCII.** American Standard Code for Information Interchange. For our purposes, an ASCII file is a plain text file, one that consists entirely of

the characters you see on your keyboard.

**Directories.** Your hard drive has a main directory called the *root* or *home* directory. Directories created off the root directory are called *subdirectories*. When we provide the name of a subdirectory, it will look something like this: *\WORD\FILES*. Here, the root directory has a subdirectory called *WORD*, which in turn has a subdirectory called *FILES*.

**File placement.** We assume that the following files are in your root directory: *AUTO-*

*EXEC.BAT*, *CONFIG.SYS*, and *COMMAND.COM*. We also assume that your DOS files are in a DOS subdirectory, usually called *\DOS*.

**Keystroke combinations.** When you should hold down one key while pressing a second, we indicate it this way: *Alt+F4* (press the *Alt* key and hold it down while you press the *F4* key). When you should press one key, release it, and press another, we indicate it this way: *Alt, F4* (press the *Alt* key, release it, then press the *F4* key).

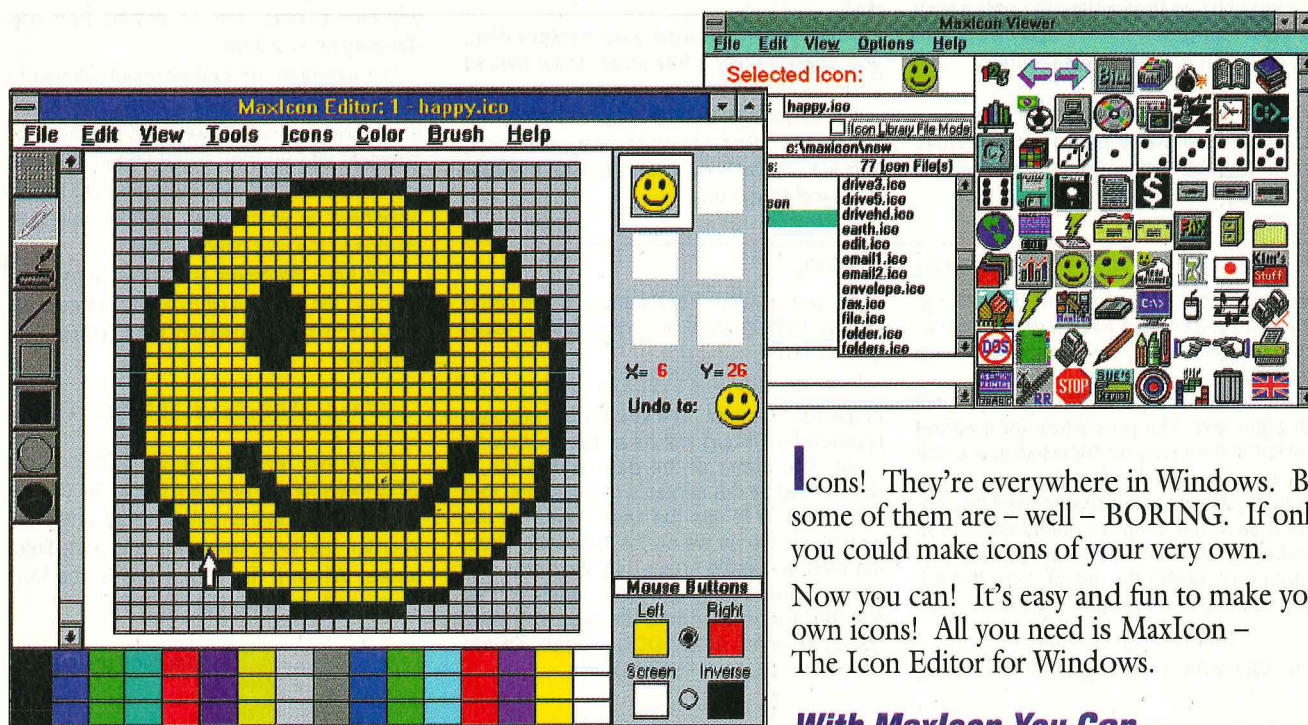


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## QBASIC PROGRAMS

QBasic is the programming language included in all versions of MS-DOS since version 5. The name of a QBasic program always ends with the extension .BAS.

**Typing in the listing.** Type QBASIC at the DOS prompt and press Enter to start. Now type in the listing as printed in the magazine, pressing Enter at the end of each line. Note that when a line in the listing is indented two spaces from the line above it and doesn't start with a QBasic command or keyword, it's a continuation of the previous line. Other indentations, or none at all, indicate the start of a new line.

**Subroutines and functions.** QBasic listings often include subroutines and functions, and typing them is confusing at first. They begin with a line containing the keyword SUB or FUNCTION. Note that when you type a SUB or FUNCTION line and press Enter, all other lines you've typed will disappear from view. This can be disconcerting for beginning programmers. There's nothing to worry about—your listing is safe. To avoid screen clutter, QBasic simply hides other parts of your listing when you're typing in a subroutine or function. To see the other parts of your program, open the View menu at the top of the QBasic screen, then select SUBS. The SUBS dialog box will appear, letting you select the part of the program listing you want to view.

**Saving a listing.** Save your partially completed listing as you go along, rather than waiting until you've typed in the whole thing. To save, open the File menu, choose Save, and type in a filename when QBasic prompts you. We suggest using the file-

name specified in the magazine article. Subsequent saves of your listing won't prompt you for a filename, but will instead use the filename indicated the last time you saved the listing.

**Running a program.** After you've typed in the entire listing and saved it a final time, you can run the program by selecting Start from the Run menu or pressing Shift+F5. If QBasic finds an error, it will stop the program and highlight that line. To run a QBasic program (a .BAS file) stored on your hard drive, start QBasic, then select Open from the File menu. Choose from among the .BAS files displayed in the open dialog box to load the program into QBasic, then select Start from the Run menu or press Shift+F5.

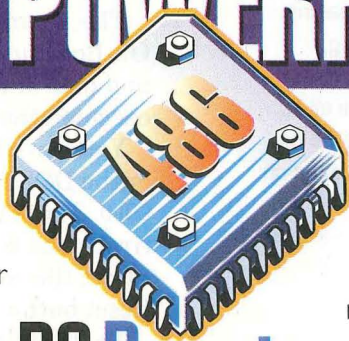
**DOS World BBS.** Typing and debugging a long listing is time-consuming. If you have a modem, our listings are always available on *DOS World's* bulletin-board system (BBS) at 603-924-3181. There are no connect-time charges; you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8, N, 1). Dial the number and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on, so that we may set up your account. From this point, on-screen prompts are the same for all users. A series of messages present the latest BBS news; press Enter after each message to go to the next screen. From the Bulletin Menu, Bulletin #1 offers information on navigating the Main and File Menus, with instructions for listing, marking, searching for, and downloading files. ■

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## SHARE THE WEALTH

Shareware Exchange" invites you to send a copy of your favorite shareware program, along with a description and an explanation of why you like it (500 words or less), to Shareware Editor, *DOS World*, 80 Elm St., P.O. Box 802, Peterborough, NH 03458-0802. Tell us how we can obtain a copy of the program. We'll pay contributors \$50 for each program featured in this column. Please don't send us shareware you've written—we want recommendations from users, not authors. Contact us on CompuServe at 75300,2361 or on the *DOS World* bulletin-board system (BBS) at 603-924-3181.

All programs featured in "Shareware Exchange" are available electronically from the *DOS World* BBS. There are no connect-time charges—you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8,N,1). Then dial 603-924-3181 and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on. (You must answer the questionnaire to set up your user account and gain access to the BBS.)

From this point, on-screen prompts are the same for all users. A series of messages present the latest BBS news. Pressing Enter after each message takes you to the next screen. When you reach the Bulletin Menu, read Bulletin #1 if you need help downloading files. After the Bulletin Menu comes the Main Menu. Press F at the Main Menu to go to the File Menu. At the File Menu, the quickest way to download files is to press D and type in the filenames. If you don't know the filenames or want to browse through them, press L to list them. While they're listed on screen, you can press D to download files or M to mark them for later downloading. You can find complete information on listing, marking, searching for, and downloading files in Bulletin #1.

QEDIT3.ZIP, ON-BOOT.ZIP, and FINDIR.ZIP are all in File Area 5: Shareware Utilities. In addition, most of the programs described in "Shareware Exchange" can be found on major on-line services and local BBSes.

—Eds.

(Continued from page 88)

and other special effects, use QEdit for simple tasks and a full-featured word processor for complex documents.

QEdit was originally developed as a programmer's editor, evident in its ability to use variable and smart tabs and to set tab stops based on the extension of each file. If QEdit won't do something you want, it includes an extensive macro language that can either read keystrokes as you type or accept macros created as full subroutines.

If you're still using DOS's EDIT or (shudder!) EDLIN, take a look at QEdit: It's one of the best text

editors around. And, even better, it's available in three flavors:

- standard QEdit, which runs as a DOS application, as you'd expect
- a TSR version, memory-resident while you run other DOS applications, so that you can jump into your editor at the stroke of a hot key
- an OS/2 version, for those who want the same editor, with the same features, in both OS/2 and DOS.

### One-a-Day

In the past several issues of *DRG/DOS World*, we've listed a number of batch files and Debug scripts that automate running a program once a day. The idea is that the batch file or COM program is smart enough to run some command (perhaps SCANDISK or a backup program) when you turn your computer on in the morning, but not every time you reboot.

R.G. "Ray" Tambash of Norfolk, Virginia, has apparently tired of these discussions and programs:

*In answer to this burning controversy, I humbly submit the definitive answer: **On-Boot**. This straightforward utility executes warm boots or cold boots on command. In addition, it can execute a command once a day.*

To use On-Boot (look for ON-BOOT.ZIP on the *DOS World* BBS) for daily execution of a program, add just this one line to your AUTOEXEC.BAT file:

ON-BOOT DAILY command

The command can be any program or batch file. On-Boot runs the program and also resets the time and date of its own file to show when the system last executed the command.

You can also run On-Boot from either a batch file or the DOS prompt by typing ON-BOOT WARM or ON-BOOT COLD. These two commands reboot the computer. The first does a warm reboot (like pressing Ctrl+Alt+Del); the second does a cold reboot (like pressing the Reset button).

That's all you have to know about this simple and useful program, except that it's been around since 1989 and it's free. It's not shareware, so you don't have to register On-Boot—just download it and start using it. On-Boot works with all versions of DOS since 2.0, and with almost all IBM-compatible computers. It's a simple, small (1.6K) program that does one thing very well—certainly worth trying.

### A Better CD

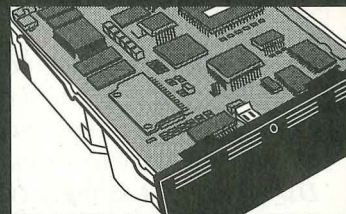
Tired of DOS's weak CD (or CHDIR) command? Robert C. Casas of Glenview, Illinois, has found a solution:



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IDE			
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341MB	13ms	ST3391A	\$193
420MB	14ms	ST3491A	\$205
545MB	12ms	ST5600A	\$259
722MB	12ms	ST3780A	\$375
1083MB	12ms	ST31220A	\$495
SCSI (WIDE SCSI also available)			
1052MB	9ms	ST31200N	\$579
1700MB	9ms	ST11900N	\$1019
2145MB	8ms	ST12550N	\$1219
2148MB	9ms	ST12400N	\$1090
4290MB	9ms	ST15230N	\$1889
4290MB	8ms	ST15150N	\$2199
9080MB	11ms	ST410800N	\$3459

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342MB	12ms	LPS340A	\$199
541MB	12ms	LPS540A	\$252

SCSI			
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270MB	12ms	LPS270S	\$189
342MB	12ms	LPS340S	\$215
541MB	12ms	LPS540S	\$265
1080MB	10ms	IMP1080	\$579
1440MB	9.5ms	IMP1440S	\$749
2160MB	9.5ms	IMP2160S	\$999

## IBM

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527MB	12ms	70G8486	\$259	
728MB	12ms	70G8511	\$379	
1052MB	8.6ms	70G8512	\$619	
SCSI (WIDE SCSI also available)				
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527MB	12ms	94G2441	\$289	
728MB	12ms	94G2422	\$449	
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Toshiba XM3401	2X	200ms	\$258
Teac CD50	2X	265ms	\$209
Sanyo SH93R	2X	280ms	\$165
NEW! TEAC SUPER QUAD	195ms	IDE	
CD ROM DRIVE w/ controller			\$339
w/ Sound Blaster & CD Titles			\$489

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SB= Sound Blaster 16 SCSI. SA= Sound Blaster SCSI ASP.		
PREM	PRO	SA
SH93R	\$289	\$409
CD50	\$359	\$485
XM3401	\$425	\$549
CDR510	\$449	\$569
XM3501	\$569	\$689
PX43CH	\$599	\$729

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A1542CBASIC 16Bit SCSI	\$239
A2742 EISA SCSI	\$359
A2842 VESA SCSI	\$259
A2940Kit PCI SCSI	\$299
Future Domain 1680 16Bit SCSI	\$139
QLOGIC PCI SCSI & WIDE	\$325
PCI 4IDE, incl. CD ROM & FAST ATA	\$59
ALPHA RESEARCH CACHING CARDS	Price
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S4751 32Bit Local Bus IDE	\$129
S4851 32Bit PCI IDE	\$229
SCSI Controllers include COREL SCSI	Price
S425S 16Bit SCSI	\$229
S475S 32Bit Local Bus SCSI	\$369

GSI 16Bit IDE accelerators (enhanced IDE)	Price
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1533-21 2IDE, 4 Floppy	\$65
1533-32 2IDE, 4 Floppy, IO	\$129
4C 16Bit supports 8 IDE	\$139
MaxIDEA software accelerator	\$34
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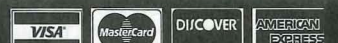
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Toshiba 3501	\$999	\$2099	\$3579
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*Does the DOS CD command irritate you? Isn't it frustrating when you type the wrong letter in a name when changing directories and DOS spits back, "Invalid Directory"? Try Guy Campbell's freeware utility **Find Directory 4.0**. Simply type FD plus a full or partial directory name, and Find Directory will change to that directory. It makes finding and changing directories so much simpler you have to wonder why the people at Microsoft never thought of it!*

I like Find Directory (FINDIR.ZIP on the *DOS World* BBS) because it searches all your hard drives for the requested directory name and can switch automatically to the correct drive volume. If you're logged to drive C, for example, and the target directory is on drive D, Find Directory will change drives as well as directories.

Find Directory isn't quite as fast as DOS's CD command or the popular Norton Utilities program called NCD, from Symantec. (CD is fast because you need the exact name of the new directory, not just a partial name. And NCD is fast because it keeps a database of directory names, which takes up room on your hard disk.)

Find Directory is different because it doesn't build a directory database that may be out of date after you add and delete subdirectories, and it doesn't require a full directory name—just enough to distinguish one directory from another.

Earlier versions of the Find Directory program searched network and CD-ROM drives, which can take a long, long time. The latest incarnation, version 4.0, however, includes a companion program, LimitFD, which lets you set the highest drive letter the software should search. Once you run LimitFD, the program will no longer search beyond those drives unless you want it to.

Find Directory is intended for hard-drive use, but you can also tell it to search floppy drives for the directory you want.

I found two small problems with version 4.0. First, it seemed to get confused when I started it from a drive created with SUBST. For some reason, it

## PRODUCT INFORMATION

The shareware price shown is for registration only. The vendor may charge additional small fees for shipping and handling, extra disk copies, and printed documentation.

### Find Directory 4.0

Guy Campbell  
620F Kingswood Lane  
Simi Valley, CA 93065  
805-579-9116  
freeware

### On-Boot

Cove Software Group  
Christopher J. Dunford  
P.O. Box 1072  
Columbia, MD 21044  
freeware

### QEdit Advanced 3.00c, \$59

SemWare Corp.  
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wouldn't go back and search the main drives, just the SUBST drive to which I was currently logged.

The solution was easy: I used LimitFD to limit the program to searching my actual hard drives plus drive volumes created by Stacker. By telling Find Directory to ignore the drive letters I created with SUBST, I eliminated the problem.

The second odd thing about Find Directory is that version 4.0 includes the wrong documentation. The ZIP file includes documentation for LimitFD and for FH, another utility distributed by Guy Campbell. But that's not a real problem; the README.DOC file plus the help message, which appears if you type FD/?, are all you need.

As Robert Casas says, this program is freeware. There's no registration fee required or requested. Find Directory is only 11K in size, so it doesn't take up too much room on your hard disk. It's a handy, free program that deserves a place in your utilities subdirectory. ■

*Contributing Editor Hardin Brothers has been working with computers and writing about them for 15 years.*



## SPEEDY CD

Beginning with MS-DOS 6.2, the SmartDrive utility can cache a CD-ROM drive, provided it knows the drive exists. If you want to cache your CD-ROM drive—to reduce the time it takes to access the drive—make certain that the line in AUTOEXEC.BAT that calls SmartDrive (SMARTDRV.EXE) appears after the line that loads MSCDEX.EXE, the program that enables DOS to recognize a CD-ROM.

—Jack Nimersheim



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\*After rebate

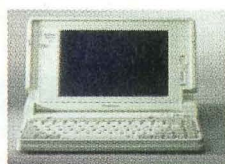
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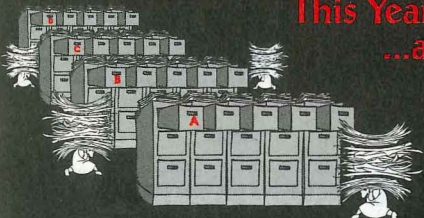
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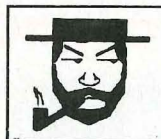
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# Short and Sweet

by Hardin Brothers

**W**e've had a great month here in the New Mexico mountains. The weather has been perfect, we're ready for winter, the bears and bobcats that wandered up to our house during the summer are now back in the mountains—and I've received some terrific shareware nominations for this column. You won't need much disk space to try these programs; they're so small and fast they should fit on even the most crowded hard drive. Programs discussed here are available on the *DOS World* BBS, 603-924-3181; see the accompanying sidebar, "Share the Wealth," page 80, for details on using the system. Prices are listed in the "Product Information" box, page 82.

## Top-Notch Editing

The first nomination is from L. Braden Pletzer of Weston, Ontario, whose submission nominated a program whose earlier versions I've used often in the past:

**QEdit Advanced 3.00c** is a small DOS text editor you can use on all computers, from an 8088 to a Pentium. You can even run it from a low-density floppy disk. (It uses less than 70K of disk space.) Its capabilities are sophisticated, especially considering its small size and low memory requirements. There's even on-line help. I've found QEdit to be a powerful replacement for EDLIN on computers running DOS 4.0 and earlier. It even gives DOS's EDIT.COM a run for its money.

I've written about excellent text editors in this space before, but QEdit (QEDIT3.ZIP on the *DOS World*

BBS) is certainly one of the best. I took a look at shareware version 3.00c, and I certainly wasn't disappointed. I don't have enough space in this column to even list all its major features and capabilities.

You can customize QEdit almost any way you want. You can configure all the special keys on the keyboard, set screen colors and appearance, tell it

how to handle tabs and spaces, and even set the way it saves files to disk.

Within QEdit, you can edit multiple files at the same time, view up to eight editing windows (which can hold different views of the same file or different

files), use ASCII characters to draw lines and boxes, and work with up to 99 scratch buffers for cut-and-paste or template operations.

QEdit's Search and Replace commands can work globally or within a marked block, and you can shift entire blocks of text left or right. QEdit even lets you set the cursor size—handy if you're using a laptop or notebook computer and have trouble seeing the cursor on screen.

Although QEdit is primarily a text editor, it offers word-processing features such as word wrap, paragraph reformatting, text centering, commands to change character case, and flexible margin commands. It can also include the time and date in a document automatically.

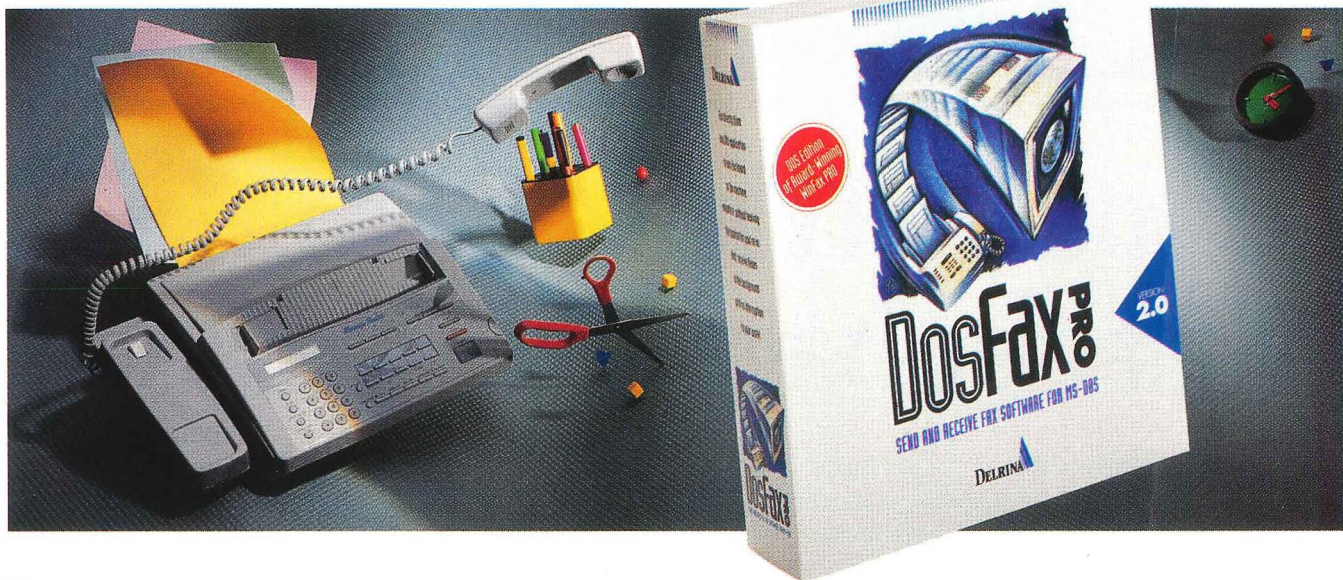
If your word processing is limited to notes, memos, and electronic reports, QEdit may be the only editor you need. If you use fancy fonts, embedded graphics,

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(Continued on page 80)



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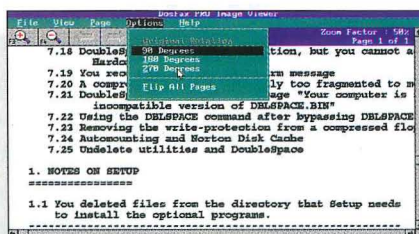
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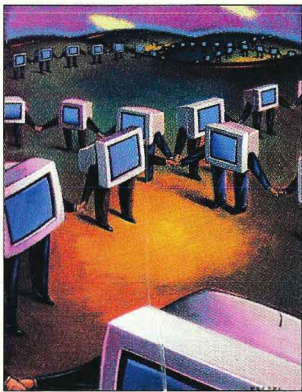
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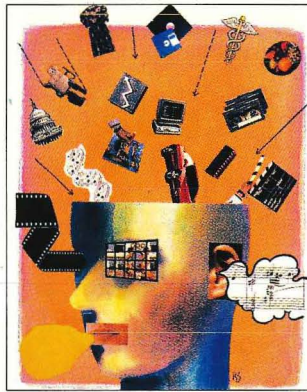




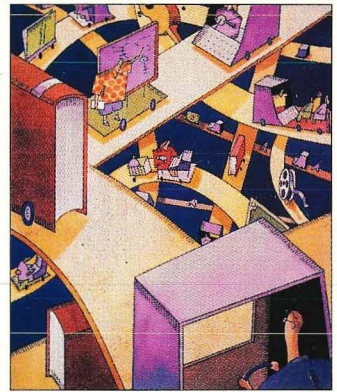
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MemMaker, the memory utility that comes with DOS 6, does an OK job of delivering additional memory, but it just hasn't kept up with demanding users.

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'tune' it. And then you might end up with 490K or so to use. But QEMM 7.5 routinely returns 634K of conventional memory. And when you consider as little as one 'K' of memory makes the difference between a program loading or not, you can see where an additional 140K or so could be vital.

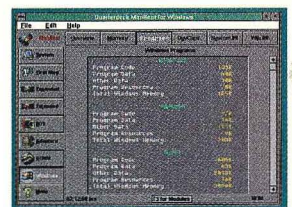
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